SUPPLEMENT.

The Mining Journal,

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FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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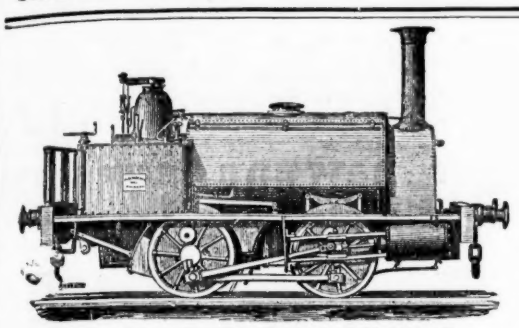

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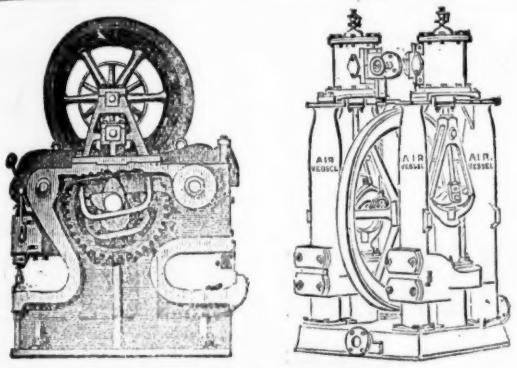

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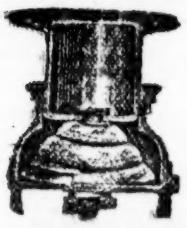

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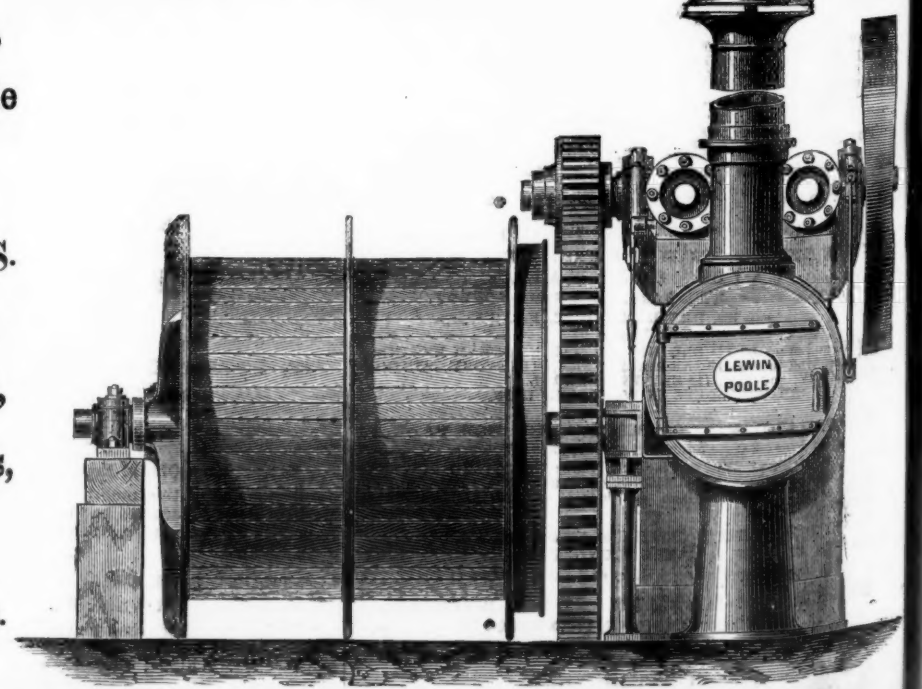

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Original Correspondence.

THE STAFFORDSHIRE ENGINEERS, AND THE MACHINE COAL-CUTTING EXPERIMENTS.

SIR,—When the Mining Engineers of South Staffordshire and East Worcestershire were watching the working of a coal-cutting machine in the pits of the Pelsall Iron and Coal Company, in that part of the kingdom to which they were invited by Mr. W. Ness, at that time the mining engineer at Pelsall, they were made sensible of the value of the machine when actuated by compressed air; but they indulged an anxious wish that such a machine should be devised as might with facility be transported from one part of the pit to another, such a machine as a burly collier might lift upon his back and carry. The Staffordshire field is a wonderful one, and is subject to wide difference in respect alike of seams, of quality, and of condition of working. To the Staffordshire engineers, therefore, it became a matter of importance that any machine which they should be desired to adopt should cut horizontally and vertically, should be as portable as possible—in a word, should be "handy." These engineers had many of them handled the collier's pick; all were familiar with the arduousness of the miner's toil, and they wished to lighten it. We are not surprised that to such men a hand-machine should seem to be the apparatus most to be desired in such a district. As men who not only wish but are prepared to act, the chief section of the Staffordshire engineers (the South Staffordshire and East Worcestershire Institute) forthwith came before the world with the offer of a 20-guinea prize for the best hand-worked coal-cutting machine.

Elsewhere, in this week's Journal, you doubtless record what took place on Monday in one of the pits of the Earl of Dudley, when two of the three machines which had been entered as competitors for the prize were tested before the Council of the Institute, for the council are the judges and have to award the guerdon. Inasmuch as the question of officially pronounced merit is not settled we will not ourselves anticipate the result. Nor need inventors themselves be chagrined if the trial in Staffordshire should not be so satisfactory as they would have wished. On the other hand, if in a trial in Staffordshire they should succeed they may well congratulate themselves upon their success, even though it be that the competitors were few. It was intended that the trial should be a severe one, and in this there was no failure. Some hard thick coal was selected, and upon this two machines were soon set to work. Proof of the hardness of the seam was soon apparent in the giving way of certain of the easily-replaced teeth of the saw of Mr. J. G. Jones's patent, shown by Mr. Macdermott, of London.

The machine which Mr. R. S. Norris has patented, and that contemplates the getting the coal by drills, was next put to the face, and it bored 2 ft. 9 in. by 4 in. in half-an-hour. Mr. Macdermott, with his saws, had accomplished a length of 2½ ft. and 2 ft. 3 in. in depth in an hour. The third machine entered was that patented by Mr. J. E. Smith, but it was ultimately withdrawn. It may be briefly described as weighing about 2 cwts., and is adapted for moving upon pit tramways; has a powerful frame, and carries a cutting-head, having both lateral and forward action. Before the trials began the Institute had also received papers descriptive of the tools which had been invented respectively by Mr. James Donaldson, of Birkenhead, and by Mr. W. J. Clapp, of Nant-y-Glo, Monmouthshire. Mr. Donaldson's is hand-worked; and believing that the principal cause of failure in the majority of the existing coal-cutting machines lies in their rotary or grinding motions, he has striven to go back to the action or motion of the pick or jumper, as wielded by the collier, and which deals a sudden sharp blow. This in his machine Mr. Donaldson attempts to effect by the use of a series of cams and weights. In such a trial as that in Staffordshire he would use three tools—two for holing out the top and bottom of the cut, and the third to act as a lever to bring away the block of coal. The motion is horizontal, by screw or by teeth gearing, and the inventor estimates the force of the blow of his machine when driven by one man to be from ¼ to ½ cwt.

Mr. Clapp's machine is quite a new one, and, like that of Mr. Norris, it designs the use of drills. Two-horse power, either steam or compressed air, he estimates equal to drive in nine borers a depth of 3 ft. in three minutes. This accomplished, the machine is rerersed, and in seven minutes the borers are withdrawn and refixed. Thus six insertions are accomplished per hour, or a total of nearly 40 superficial feet under-cut in that time. The motive power is applied by means of a driving-chain carried along the face of the coal. If it should be worked by hand three borers only could be used. Mr. Clapp has tried his machine upon a lage block of Bath stone, and also upon a similar piece of coal, but we are not yet aware that it has been tested in a pit. It is of interest, however, to know that where hard coal has to be cut the inventor recommends nine drills, and for softer coal from 11 to 13. Where the roof or the parting is hard stone or shale the wedge, he says, may be employed to bring down the coal; but where the roof is soft or sticky 1-in. holes should be drilled in about every three yards along the face, and similar charges of powder used to blow down the coal. Mr. Clapp holds that as much work can be done by one of his machines as could be performed by ten pikemen in holing. One man is enough, he explains, to attend to his machine when it is at work, and no more than two men are required to remove and to readjust it. We have given most space to a description of Mr. Clapp's invention, because it is one of the newest. Our notion, however, is that an effective coal-cutter will dispense with the use of powder; and that for actual wear and tear in the majority of seams that machine—whether worked by steam, or by compressd air—will most meet the requirements of the case the action of whose cutter most resembles the action of the pick. In this respect, Mr. Macdermott's views are fully confirmed by Mr. Ness, who adopted such a machine at Pelsall, after watching many at work.

It cannot be said that the experiments in Staffordshire have been highly successful in immediate results. By that it is not to be inferred that they have been unsuccessful. On the contrary, we believe that they have accomplished a very great deal. They have shown the inventors of coal-cutting machines wherein their tools are at present less effective than it is desirable they should be as cutters of hard coal; they have stimulated the interest in the machine question; and they have imparted fresh vigour to the inventive genius of those men who have already given much practical attention to the subject. Cutters may be able to do a great deal in soft and thin seams, but may prove of only little worth tested upon the hard coal of Staffordshire. It should be to the consolation of those inventors whose machines were tried on Monday that there is no harder coal in the country than that composing certain Staffordshire seams. The gentlemen who brought forward the machines were each and all surprised at the hardness of the coal which they were required to cut. Mr. Norris designated the work as like "cutting cast-iron;" and Mr. Macdermott, who expressed his disappointment at the result of the working of his machine that day, remarked that he had elsewhere done four times, and in one instance six times, as much with the same machine. Mr. Spruce, who had prepared the pit for the trials, comforted both Mr. Norris and Mr. Macdermott, and likewise all other inventors of similar apparatus, with the assurance that the coal they had that day worked upon was not the hardest he could have found for them; for he had pits under his care where the coal was "half as hard again." The fact, we feel sure, will not daunt those who have given their attention to coal-cutting machines; but it will not greatly encourage them in their endeavours to produce for such a district a machine worked by hand. Further than for drilling shot-holes the Staffordshire Engineers must, we think, abandon their design of getting manual machines. In the actual work of getting coal in such mines the force of steam or of compressed air is required. Mr. Macdermott and others have supplied them with hand-drills; and soon "handy" tools, actuated by such motive power as has proved most effective elsewhere, will be adapted to the Staffordshire mines.

The outcome to Staffordshire will be nothing but benefit—benefit by which the men as well as the masters will be served; for it is not desired to make the machine the master but the co-worker of the collier, and thereby the lightener of his daily toil. The Staffordshire engineers have laid not alone their own but also other districts under obligation by the spirited offer which led to these trials. It is impossible but that in endeavouring to make a machine suitable to the hard coal of Staffordshire inventors should improve the tools previously suitable to remote fields. Of this Mr. Norris has given an assurance in the statement that the machine he tried, and which has cut well in Lancashire, shall, as the result of his experience on Monday, be made so perfect within a month as that, worked by compressed steam, it will get a 2-ft. seam in Lancashire which at present is lying profitless. The Staffordshire and East Worcestershire Institute of Mining Engineers, and the inventors who have responded to their challenge, merit and may we not say they receive, the thanks of the whole mining community.

CORRESPONDENT.

THE DUKINFIELD EXPLOSION.

SIR,—In an article in the Journal of Aug. 8 the writer proceeds on the assumption that if the colliery officials had correctly reported the state of matters the explosion would not have happened; but this, I contend, is an erroneous assumption. I have no doubt whatever the report books may have been most faithfully entered, and that no one in the management had the slightest idea of the accident which was about to befal the colliery. John Bryant may have conscientiously said that the external parts of the machinery were apparently all right, and Mr. Crow and his friend Evans might as faithfully have reported that No. 25 and John Handley's place contained a little gas, but this had not the slightest bearing upon the explosion. *The explosion happened at a point where nobody expected an explosion would have taken place*, and if true daily reports in the form the writer suggests had been kept at the Astley Pit, and the contents of them made known and acted upon, the present Act would have been insufficient to prevent the Dukinfield calamity. So far as I can see there is no chance of diminishing accidents from explosions but the prohibition of naked lights and gunpowder in a mine in which gas is known or suspected to exist. Of course, in this case there would be the risk of the neglect of the lampman to examine and lock the lamp properly, but this will probably be much less than the use of naked lights.

AN ENGINEER.

LAKE SUPERIOR COPPER MINING.

SIR,—I have occasionally called your attention to the valuable mines of this section of country, and have remarked how surprising it is that English capitalists do not consider of such rare opportunities for investment—not one or two mines only, but there are several which can be obtained, and, upon a very moderate amount of capital, could be placed upon the Dividend List, paying from 15 to 25 per cent. profit. I enclose you the company's advertisement of the Victoria mining property, for sale or lease, which first appeared in the Ontonagon *Miner* of July 25. This property I am fully acquainted with. The mine is opened by four shafts, from 300 to 400 feet apart. The adit at the deepest point is 10 fms. One shaft is 5 fms. below the 40 fm. level; one 5 fms. below the 30; one to the 30; and the other 20 fms. below adit; and all connected in due course. The pumps are 6-in., and can keep the mine drained by working from six to eight hours in 24. The plan of hoisting is by kibbles, but as the shafts are all sunk on the course of the lode from surface, the true policy would be to put in railroads, commonly called here skiproads. The incline of the lode is 45°, and ranges from 5 to 20 ft. wide. Stamp rock of 3 per cent. could be easily obtained up to 100 tons per 24 hours, and as the mine opens that amount could rapidly be increased; it also produces a good share of heavier grade, pieces from the smallest size up to as large as 30 or 40 gallon barrels would take in, called here barrel-work, which is commonly cleaned up from 66 to 75 per cent.; and still heavier pieces, up to 20 and 30 cwts., are frequently found of about the same percentage. The water-power spoken of is all-sufficient to drive 1000 heads of stamps if required, and the nature of the place is such that a common over-shot or turbine wheel could be applied, there being a basin close to the river, 50 feet deep, not exceeding 100 feet wide, and perfectly secure from the river in all emergencies. A first-class opportunity for power for all purposes in any mine, no matter what the size. In my estimation the property is the best of any in this county. The shafts could be sunk for $12 to $14 per foot, drifting from $8 to $10, stoping from $20 to $22 per solid fathom &c.

As I am going to Portage Lake in a few days, I will try to send you some news from that quarter. The mines there are doing exceedingly well; and the mines here are equally as good, if worked right.—*Ontonagon, L.S., Michigan, July* 26. HENRY BUZZO.

THE DIAMOND SWINDLE.

SIR,—I think it a mistake on the part of a "San Francisco Correspondent" to revive this affair for the sake of exonerating certain parties whose names have figured so conspicuously in connection with it. It will require much more of logic and facts than he has furnished to convince the public that others, besides Arnold and Slack, were not privy to the swindle. The facts as stated by him, and published in the Supplement to last week's Journal, are very insufficient to exonerate all the parties implicated. That Mr. Janin was the dupe of his own conceit, and that Mr. Ralston and some others were the dupes of a misplaced confidence in Janin, may be easily, and without prejudice, admitted. It would have been much more satisfactory, however, if, when speaking of the loss sustained by Mr. Ralston and a few of his friends, the loss of the parties who intervened between them and the original *figures* in this interesting drama had been given also, and in what respect that loss had been incurred. The fiction, for so it appeared to me, that Arnold must have gone to London during the interim pending negociations and purchased, with $20,000, what is familiarly spoken of as a sack of diamonds, is an improbability that no reflective person could be found to accept. That the enterprise was a success, so far as Messrs. Arnold and Slack were concerned, is an admitted fact, but, beyond that, it can only be looked upon for all parties concerned as the most humiliating and degrading failure.

The gratification of Messrs. Arnold and Slack will, no doubt, be intensified on learning that an attempt has been made to make them the scapegoats in the affair, and that their consummate cunning and genius combined, enabling them to wheedle so many clever ones, has raised them to the dignity of heroes, especially when they take into consideration the fact that San Francisco takes credit to itself for being equal to any emergency in business tactics. Allow me, Sir, to express my dissatisfaction with, and dissent from, the explanation given by a "San Francisco Correspondent," otherwise than so far as I am ready to exonerate Messrs. Janin and Ralston, except on the score of ignorance, from any complicity in the matter. Janin was no doubt unequal to the duties which he had undertaken, and Ralston was very probably deceived by his misplaced confidence in Janin; but ignorance is sometimes culpable, and in this instance I do not see how it can be wholly exonerated. Ordinary precautions, as the sequel will show, seem not to have been had recourse to. It is immaterial to the public whether it is deceived by a professional expert through ignorance or design. The difference in moral turpitude of individual acts cannot be applied in mitigation of the consequences which may arise therefrom; and when we are told, as we now are, by a "San Francisco Correspondent," that after the representative gems from the supposed diamond field were found to be nothing more than quartz crystals, and that diamonds such as are used for rock-drilling purposes were successfully substituted, I think I am justified in saying that ordinary discrimination could not have been observed, and that the ignorance arising therefrom was culpable in its character, and of that class which gentlemen of Messrs. Ralston and Co.'s general intelligence ought never to have allowed themselves to be made the victims of.

The alleged successful substitution of rock drilling diamonds for Nature's unwrought gems gives to the so-called "history of the scandal" an air of romance which takes it entirely out of the category of history, and fatally vitiates its claim to be a simple narrative of events. It is affirmed of Mr. Janin that he is an eminent geologist; that may be true in a Californian sense, but according to English ideas geologists are not so cheaply manufactured. A little knowledge of the properties of minerals would have enabled anyone to discover the difference between quartz crystals and diamonds, however fascinating the former may have been. JOHN BULL.

THE MANAGEMENT OF BOG AND PENNERLEY MINES.

SIR,—If the gentleman signing himself "A Large Shareholder" in the above mines, and whose letter on the subject in question appeared in the *Mining Journal* of last week, had appended his name thereto, the compliment intended for me would not have placed me in the invidious light it has done with my neighbour, and I believe my friend, Captain Harris.

The directors of Bog and Pennerley Mining Companies offered me the local management of their mines previous to Capt. Harris's appointment, and not having accepted the post will, I trust, be sufficient to convince those I would, if needs be, like to convince that I am not seeking and would not accept it now. It is against my pride to have to write this, but in the face of "A Large Shareholder's" letter I feel bound, in justice to myself, to speak in a way that shall be understood by my friend Capt. Harris.

And now about the management of Bog and Pennerley. There is no one in the district who knows those mines, the state they were in, nor the amount of labour and enormous difficulties which had to be overcome in Capt. Harris's time, better than I do, and my candid opinion is that the right man is in the right place; that he has had equal experience; possesses a knowledge of practical mining equal to that of any agent in the locality; and, what is more, is an honest, industrious man. I would assure Captain Harris that the letter to which I refer is a great grief to— ARTHUR WATERS.

CORNISH TIN MINING, AND THE PRODUCTION OF SLATE AND CHINA-CLAY AS CHANNELS OF INVESTMENT FOR CAPITAL.

SIR,—In the *Mining Journal* of last week I observe some very pointed and important statements from the pen of Mr. R. Tredinnick. That Australia is bound to supply immense quantities of tin for the future is morally certain. It also appears pretty clear that tin exists there in such abundance that it only requires tapping, by a paying price, to overflow the market; and it further appears, with too great certainty for the good of our home tin mines, that it can be brought to market at a less cost than from the latter.

A few years since the present price of tin would be considered fair; but what good is it for our Cornish mines now? The very richest can but just pay, and the bulk are squeezed out of existence. If Mr. Tredinnick is correct in his statement, that the very richest tin mines are only paying about 3 per cent. on the invested capital, what prospects are there for the out adventurer to invest his capital in them? To say nothing of what are termed progressive tin mines. I thought proper to point out, in a communication to your valuable Journal about three weeks since, one or two other channels which present unquestionable soundness for the investment of capital. These channels are the production of slate and china-clay. The fluctuations in these large industries of the country are next to nothing when compared to the generality of speculations. It may be admitted that worthless slate quarries and clay works have been, and perhaps are being, palmed off on the public by speculators, whose object is to get money more particularly out of the investors' pockets than by the legitimate working of the concerns; such bubbles invariably come to worse than nothing, and have no claim whatever to rank as public investments. They are, to say the best of them, "swindles." Properly selected slate quarries and clay works rank among the best investments the country will afford.

Aug. 19. OBSERVER.

CORNISH TIN MINING, SMELTING, AND MERCHANDISE.

SIR,—Referring to my numerous correspondents through the aid of your valuable columns upon the subjects treated in my letter of last week, allow me to state that there ought not, and should not, be any insuperable difficulties in the way of declaring Portreath and Hayle free ports equally with Falmouth, Plymouth, and Southampton; nor should there exist any permanent monopoly in carriage of material and ores by the West Cornwall Railway. Mines have only to be true to themselves, and neither the landlord, or merchants, or railways can successfully cope with them. It is true that property, like capital, has its respective value against labour and enterprise; neither is independent of the other; still, whenever monopolies stifle progress, natural instinct impels resistance, while intelligence points out the path in the struggle for relief and freedom. To the great mines in and surrounding the granite hills of Camborne and Illogan Hayle is, probably, the more desirable part of the two, as the road to Portreath is somewhat diffierent from the conformation of the surface, while the basin quays and approach from the offing are less commodious, and in other respects less desirable, than those at Hayle. There can be no great difficulty in the construction of a tramway to Hayle. There is only one impediment of consequence in the six miles, and 40,000*l.* ought to construct it, covering the entire costs, and thus the high charge for carriage can at once be challenged, and if needed, dispensed with, while the declaring of Hayle a free port would enable the miners to import coal from Wales of equal quality with those they now consume at 11s. 6d. to 12s. 6d. a ton, or (say) upon the same terms as the merchants do who now supply them with the fuel.

As to the smelting of tin by the miners and others, at once freeing themselves from the monopoly of smelters, I am well advised by those who are acquainted with the processes of reduction and refining that the method is both simple and rapid, and should be within the scope and compass of all intelligent managers of mines, while 1500*l.*, if not less, will purchase and erect all the buildings, furnaces, and refineries required; nay, I may add, that a retired smelter has informed me within the last few days that 1200*l.* is ample to cover the needful outlay for such mines as the Dolcoath, Tincroft, or Carn Brea, while there is no truth whatever in the assertion that either mine requires ores of different mixtures and qualities so as to render the metallic tin acceptable to the consumer. In fact, he observed that the miner had himself to blame for the low prices of his product, and also for the high charges for materials —*i.e.*, he could not expect in these days of commercial morality for the smelter to voluntarily give up his monopoly, or to teach managers how to make the most of their ores, nor could he expect merchants to throw open their ports and to invite competition. Executives must act for themselves, and if they possess neither practical intelligence nor profitable action, then so long will the dividends prove unsatisfactory and progress remain stationary. The yield of the great mines in Cornwall are good and expansive; what alone is required are well-taught and thoroughly commercial executives.

The vested interests of Cornwall and the general commercial interests of the community are two distinct problems, and not difficult to solve. Tin mining in the peninsula west of and including the Dartmoor is public property, as much so as the coal fields and ironstone of Wales and the North of England. Cornwall no longer stands alone; it seeks capital in the marts of London and throughout the provinces—as much so as any other industry in this highly mineralised country; why, therefore, should the money of the public lie dormant, or be frittered away at the beck and call of the landlords, merchants, and, with few exceptions, executives who are subservient to them? If miners only correctly appreciated their true power and position they would instantly perceive that shareholders alone should be masters, and demand their whole and undivided consideration. The superintendent of a mine should not only understand underground work but machinery, metallurgy, and chemistry. He should also possess the art and knowledge to buy and sell in the cheapest and dearest markets, and be *de facto* a thorough man of science and of universal business.

The great losses attendant on mining pursuits spring from ignorance and want of common sense. The merchants should be at the call of the executives, and the latter should be free to purchase machinery and materials without coercion, while the landlords, instead of dictating harsh and exacting terms to the miner, will soon have to pay premiums to get their mines worked, unless a speedy and

radical reform in the method of conducting their affairs be introduced. It is ridiculous to expect gentlemen practically acquainted with mining in the West to sink money in commercially worthless deep tin and copper mines, when Wales, Cumberland, Durham, and other districts offer such tempting opportunities for acquiring gains, to say naught of our colonies, and many a free and fertile foreign country. Executives must be free, unfettered, and intelligent; while all monopolies must cease to exist. Then, and then only, the cornucopia of the West will yield a renewal of dividends to sweeten the enterprise to absentee shareholders.

It is to the shallow mines that the public must look for early dividends, and these not unfrequently sell at greatly reduced prices, as instance the St. Agnes Consols, which embodies all the elements of success, with many pioneer points that can be cheaply realised, and with a degree of certainty rarely allied with speculative adventure. Again, the lodes on and adjacent to the Dartmoor exhibit unmistakable evidence of abundant mineral wealth, and they can be wrought at comparatively trifling outlay. The tin crops up close to the surface, water-power exists, while many of the veins can be opened with profit, even should tin fall another 10*l.* per ton. Mining, like horse racing, requires judgment and keen observation, with this wide difference—that the winners in mining more frequently spring from the "neglected field" than the loudly vaunted favourite in market circles.

I cannot reply to all the communications that I receive, as most of the questions raised are irrelevant and of no public utility. Yet miners and shareholders interested in tin mines will receive every consideration and information upon calling at my city offices.

43, *Bishopsgate-street, Aug.* 21. R. TREDINNICK,
Consulting Engineer.

SUCCESSFUL MINING IN NORTH WALES.

SIR,—In the list of sales of lead ore which appeared in last week's Journal was 40 tons sold by the South Prince Patrick Mine (near Holywell). Some of the shareholders may not have noticed the list, and probably are not aware of the success of the mine, which may be taken as an accomplished fact. There are large reserves of ore in the mine, and it is getting still richer, the roof, and floor, and sides, forebreast, and also cross-cut out of the level, are rich. The Captain (John Jones) states that he has been in some of the richest mines in Flintshire, but never saw anything equal in richness to the last 8 yards. It joins the Prince Patrick Mine, which is paying 20 per cent.; but I think, for the capital employed, the South Prince Patrick Mine is not equalled in North Wales, which dividends may prove. It is very gratifying to those who brought out the company not twelve months since, and spent their own money in it before asking the public to invest. The same gentlemen are proving another mine, near to Holywell, which has the promise of success, and if on further trial it continues as favourable as now the public will be invited to join. SHAREHOLDER IN SOUTH PRINCE PATRICK.

GOLD MINES OF MERIONETH.

SIR,—Your correspondent, "I Pede Fausto," writing on the above subject in last week's Journal, mentions the mine of Castell Carn Dochan, which is to be sold on the 27th inst. As this mine has been mentioned particularly, I send you a copy of a report made by one of the most experienced mining captains in Wales in May last upon it, which may be of interest. At the present moment visible gold can be found in several points in the mine, which proves it to be a valuable property.—*Bala, Aug.* 20. JOHN PARRY.

CASTELL CARN DOCHAN GOLD MINE.

SIR,—I beg to state a few facts respecting the above mine, which is situated in the Bala district, two miles west of Llanuwchllyn Station. The quartz lode runs in the direction of north-east and south-west, varying in width from 2 to 9 ft. The mine is opened by two adit cross-cuts, the upper intersecting the lode at a depth of about 15 fms. from surface. The lode to this depth for a great length is nearly excavated, and the quartz obtained therefrom, amounting to more than 4000 tons, has been stamped and amalgamated, the yield of gold from the same being over 1700 ozs. troy, making the average produce 8 dwts. to the ton. The lower adit cross cut intersected the lode at a depth of about 35 fms. from surface, and a drivage of 50 fms. made upon the lode north-easterly. This lower adit communicates with the upper adit by two shafts, in both of which several bunches of visible gold were found. The entrance to the deep adit is level with, and close to, the reduction works. The ground between the two adits, which contains many thousand tons of quartz, is opened out for the convenience of stoping, and the stuff could be excavated and delivered on the bank at a cost of about 5*s.* 6*d.* per ton. The probabilities are that the lode will still improve in width and richness by continuing the working further east. As for its facilities for economical working this mine stands unequalled, and it will rank among the best of the gold mines in the average yield of gold per ton of quartz. MINER.

P.S.—If I had the authority of "Miner" I should have been happy to give his name, but I may mention that he has extracted gold in his time to the extent of very nearly half-a-ton. J. P.

SPAIN AND ITS MINERAL WEALTH.

SIR,—Spain, with all its variety of climate, soil, races, dialects, and "orgullo" (self-esteem), still groans under the curse of civil war, which apparently can never terminate without stamping out the obstinacy of her people, who, like the "noble" profligate, crippled in resources, luxuriates in recounting what he and his forefathers were—in vain imaginings, and being powerless amongst her sister nations she displays her despotic nature by murdering those of her household who would attempt to establish political economy and morality, and re-establish pure Christianity within her borders. But, although father fights against son, and the Church against the State, it is admirable to find that foreigners can reside amongst this people without being molested in any way, with about the same security as if they were in their quiet dwellings on British soil. Life and property are far more safe than is generally imagined, and they have a proverb amongst them—"En Espana nada se pierda"—nothing is lost in Spain. There is more said about the war in England than in Spain itself, and many untruths are written on both sides, as usual, but there cannot be two opinions respecting the sufferings of all classes of people in mind, body, and circumstances; and with regard to their willingness to receive foreign intervention, although with wounded national pride, to put an end to the disgraceful havoc being made amongst their youthful sons. Not that the foreigner is appreciated by them, or that they care to intermingle with him any further than for their immediate advantage, although aid is essential in more than one instance for the advancement of their country. Their mineral wealth being unbounded a great amount of capital is required for its development which cannot be acquired amongst themselves. Labour is plentiful, the people of both sexes are vigorous and industrious, more especially in the north, where valuable mining properties can be acquired for nominal amounts, and the works conducted inexpensively, the wants of the people being few, and very little machinery required. Calamine, blende, and iron are exceedingly plentiful, abounding along the coast, and vessels of small size approach the mines through the various estuaries along the coast for scores of miles in length, shipping enormous quantities of mineral even during the present time of difficulty. With a very small staff of intelligent practical English miners extensive works might be conducted, and made exceedingly profitable investments to a well organised company of adventurers, having sufficient subscribed capital to bring the enterprise into a proper state of working, ensuring success, and such profits as would appear fabulous to those inexperienced in such undertakings. S. B. L.

[For remainder of Original Correspondence, see to-day's Journal.]

CEMENT FOR PROTECTING CAST-IRON PIPES IN MINES.—Mr. Engelhardt, of Ibbenturen, cites the fact that the water from mines frequently contains enough acid to attack cast-iron pipes, destroying them in a short time. Oil colours and varnishes offer but a limited resistance, and the process of enamelling employed in Oberschlesia, although permanent and effective, is too expensive. Cement is not acted upon by these waters, and the only question to be settled was whether it would adhere to the smooth iron with sufficient firmness. Two similar pieces of rolled iron were taken, and one of them painted over five times with a very thin cement, so that the coating was four or five millimetres thick. Both pieces were suspended near together in that part of the shaft where the water had attacked the signal cable most violently, and were left there four months. On taking them out the unprotected iron was found to be reduced to one-third its original thickness, the other, in which a hole had been bored to suspend it, had suffered the same corrosion on the exposed portion; the cement covering was brown, but was perfectly hard and unattacked by the acid. The cement was broken off, and the surface of the iron exhibited the dark-blue colour and lustre that it had on leaving the rolls. As this coating adhered so well to the smooth rolled iron, to which it cannot cling so tightly as to the rougher surface of cast-iron, the experiment was continued on a larger scale. A 63 centimetre discharge pipe in the Oeynhausen shaft was protected on the inside with cement. The coating remained unchanged for two years, while the pump was in constant operation. At the beginning of last winter the pump was stopped, and the pipe being no longer under water, the cement was so much injured by the frost that it scaled off. Several other experiments were made with similar results. The pipes should be new, or if old, well cleaned from rust, before applying the cement, which is mixed as thin as is possible without injury to its tenacity. The pipe is moistened before the cement is applied, a thin coating of cement is put on and allowed to dry; when hard it is moistened and a second coating applied, and so on four or five times. The operation cannot be conducted so well in very hot weather, as the cement dries too quickly; nor must the pipes be exposed to frost during the operation or afterwards. This unfortunate sensitiveness to cold may, perhaps, yet be overcome by intervening some semi-elastic material between the iron and cement, or more thoroughly drying the pipes.

HAND-WORKED COAL-CUTTING MACHINE CONTEST.

The number of gentlemen from various parts of the country who assembled at Dudley, on Monday, to witness the contest for the premium of 20 guineas offered by the South Staffordshire and East Worcestershire Institute of Mining Engineers, is an indication of the interest which has been awakened in the application of machinery to the laborious work of coal-cutting. Prior to the experiments, an adjourned meeting of members of the Institute was held in the Museum of the Dudley Geological Society. There was a numerous attendance, the undermentioned being amongst those present:—Messrs. J. Field (President of the Institute), W. North (ex-President), J. Hughes (Vice-President), H. Johnson, jun. (secretary), Holcroft, Lawley, Terry, Cooksey, Job Thompson, F. North, Phillips, Vernon, W. Whitehouse, Bailey, J. Nicholson, T. Oakes, Cole, Dodd, J. Fellowes, T. Dando, T. Roper, D. Edwards, Hartshorn, Parton, Haywood, Allen, H. Johnson, sen., Gallear, D. Rogers, T. Brettell, T. Yeomans, S. Griffiths, J. T. Dawes, jun., R. Latham, T. Latham, Joseph Pearson, Geo. Williams, Walker, Lindop, Harle, &c., &c.

Mr. W. J. Lancaster, F.G.S., optician, Birmingham, was elected an honorary member, and the following gentlemen were nominated as ordinary members for election at the next meeting:—Mr. J. B. Bissell, ironmaster, The Watlands, Great Barr; Mr. Charles Hatton, ironmaster, The Wergs, near Wolverhampton; Mr. Jacob Forrest, Oak Pits Colliery, Mold, Flintshire; Mr. J. G. Addenbrooke, coal and iron master, Rough Hay Ironworks, Darlaston; Mr. W. B. Collis, mining engineer, Stourbridge; and Mr. Samuel Griffiths, editor of *Griffiths' Iron Trade Exchange*, as an honorary member.

Designs for Coal-Cutting Machines were exhibited by Mr. W. J. Clapp, of Nant-y-Glo, and Mr. J. Donaldson, of Birkenhead. A description of the former was read by the secretary, as follows:—

Mr. W. J. CLAPP, of Nant-y-Glo, has designed an apparatus for holing or cutting coal seams, which he designates the "Universal Coal-Cutting Machine," because it has been so arranged that it will cut coal in any position. It is adapted to the "long wall" or "pillar and stall" systems, or any modification of either system. This apparatus is also described as a "multiple drilling apparatus," because it is so constructed that nine drills or borers are introduced in a breadth of 2 ft. 2 in., and the borers are made to cut 3 ft. deep. The borers may be applied horizontally or vertically. In form the machine is square, and stands on four flanged wheels. The wheels are for facility of movement in front of the face of the coal. This is effected by means of guide rails, on lengths of framed sleepers, easily removable. It is proposed that they should be strutted and blocked on the floor of the working, so as to resist the thrust on the machine when at work. Suppose the machine to be in position in front of the face, jack screws at the top of the frame are screwed against a short length of timber inserted between them and the roof, so as to secure the head of the machine. We have now to watch the operation to be performed, that of propelling the nine borers into the coal. The borers are attached to a sliding carriage, and when the motive-power has been applied, by means of a driving chain, which is cleverly devised for being carried along the face of the coal at either end, or in any convenient place, it is seen that the borers are worked rapidly round, and the sliding carriage moved forward by means of a screw bar at each side of the machine. Two-horse power is equal to driving the nine borers to a depth of 3 ft. in three minutes. The machine is then reversed, and the borers withdrawn. Seven minutes are ample for withdrawing and refixing, thus giving six insertions per hour, or a total of nearly 40 superficial feet under-cut per hour. The amount of work that can be done by one of these machines is equal to that of nine or ten men employed in "holing in" by the pick in the ordinary way; and for attending the machine when at work one man suffices, whilst for removing and re-adjusting two men only are required.

Mr. CLAPP, who was present, estimated that his machine would get 140 tons of coal per day. In reply to a question, he said he could not tell the cost of the machine, but he believed it would be cheaper than any other.

Mr. DONALDSON, who was unable to attend the meeting, furnished the following written description with his drawings:—"The principal cause of failure in the majority of existing coal-cutting machines lies in their rotary or grinding motion, the tools of which can never stand the wear and tear, which is the same in action as holding them to a grindstone. To obviate this, we must go back to the action or motion of the pick or jumper, as used in the hands of the miner—a sudden, sharp blow. In the annexed design I have used for this purpose a series of cams and weights (cranks and eccentrics being too slow). In this particular case I have used three tools, two for holing out top and bottom of cut; the third acting as a lever to break away the intervening piece; the whole travelling horizontally by screw motion, driven by toothed gearing. The force of the blow, if driven by one man, could equal from a quarter to half a cwt. The principle of the machine could be modified in various ways; for instance, the tool-bar could be made to revolve, as in the action of a jumper, by using a fixed rack and travelling pinion, and using a broad cutting tool let into the end of the bar. The only difficulty in applying it to the vertical cutting in the deep seams is in fixing it so as to be stable enough to resist the blow. In thin seams, such as 4 ft., &c., it can (as in drawing) be fixed between roof and flooring by means of adjusting screws. The machine might also be made more portable by affixing wheels. The method of fitting is by having the screwed ends of the tool bar working in a nut fixed into the end of a strong wrought-iron tube, which, being turned by hand, forces the tool forward."

Previous to leaving for the scene of operations, the PRESIDENT said he hoped the gentlemen would avoid expressing any opinion upon the machines whilst they were at work. The Council would have to decide upon the merits of the respective machines, but previous to their award being given the members would no doubt be able to make known their individual views.

The visitors were then conveyed to No. 58 Pit, Old Park Colliery, which, by the kindness of Lord Dudley's principal agent (Mr. E. Fisher Smith), had been placed at the disposal of the Institute for the contest. About 200 gentlemen (amongst whom were Mr. E. Fisher Smith and Mr. Jeffries) descended the pit, where, under the superintendence of Mr. Spruce, the most complete arrangements had been made for the convenience and comfort of the visitors. The workings were thoroughly well ventilated; the roadways were remarkably clean, and even dry in most parts; and the lighting was so effectual that there was no more difficulty in reaching the scene of operations than in traversing the streets of Wolverhampton. We found the undermentioned three machines placed ready for work in the Thick coal, at a depth of 100 yards:—

1. J. G. JONES's Patent (by Mr. Macdermott, London).—Particulars: It is worked exclusively by the hand labour of two men, one boy managing the small wheel by which the cutting-bar is kept up to its work. The cutting-bar is for med by threading or stringing on a steel bar a number of small circular saws, 2½ in. or 3 in. in diameter, each saw having eight cutting points. These small saws are fixed on the bar obliquely, with an interval between them (regulated by distance pieces, or tubes cut to the same obligue angle as the saws are set at) of 1 in: the angle being such that the uppermost point of one saw covers the undermost point of the next, thus making the cut continuous. To this bar is given a double motion. It revolves (1) rapidly on its own axis, whilst (2) it is swept round horisontally in the arc of a circle, the centre of which is the centre of the machine, both of these movements being made simultaneously. The two main handles (or wheels) worked by the men give the bar its motion of revolution on its own axis; a boy managing the smaller (horizontal) wheel, which regulates the sweep of the bar into and out of the coal. The gearing for regulating the revolution of the bar is enclosed in a cast-iron casing, the bed-plate of which drops upon two light rails, 12 in. apart, supplied with the machine. The mode of action is as follows:—A length of rail having been laid down parallel with the face of the coal, the coal-cutter is placed on the rails, to which it is securely clamped. Given a loose end to begin on, the bar is swept round, cutting its way outward in the arc of a circle until it has cut a groove equal to its sweep dear to the face. The machine is then unclamped, moved to its new position (say, 12 in. further on), and cuts a second groove in the same manner, and so the work is carried on. The machine weighs about 2½ cwts. The cutters are all separate, and easily fixed on the bar, or removed without altering the position of the machine. Height, from 2 to 3 ft.; width, about 15 in.; height of groove cut, 2½ in.; depth of holing, 2 to 6 ft.

2. R. S. MORRIS's PATENT.—Particulars: Is mounted on cast-iron bed, upon which is caused to slide, by means of hand, steam, or other power, a carriage made sufficiently long to admit the traverse or progress of the drill to penetrate the coal to the depth of 3 ft. or more. This cast-iron carriage can be arranged for any number of drills, the two inner ones being worked directly off the screw shaft by means of a driving pinion, the others, being in gear, receive their revolving motion from the same source. The traverse motion or feed is accomplished by means of two pinions, cast or keyed on the two inner bosses, and geared into the nut pinion, which has a thread through it, and runs loose on the screw shaft. The clutch-box is so arranged that when in gear the whole of the drills revolve, and at the same time the necessary feed is given: this action continues until the drills or cutters have slotted the coal to the required depth, then, by means of a reversing lever, the clutch is thrown out of gear and the carriage brought back into its original position by means of the screw shaft, which transmits its power through a nut pinion, held in position by other pinions.

3. J. E. SMITH's PATENT.—Particulars: This machine consists of a strong frame about 2 ft. square, mounted and swivelling on a suitable wagon, provided with rollers or wheels suitable for the pit tramways. This frame carries a cutting head, provided with lateral and forward actions, available at any angle, and will cut a slot in the coal between 2 and 3 ft. deep, about 10 in. in length, and about 3 in. wide; it can be actuated and managed by a man and boy, and weighs about 2 cwts.

The first machine put to work was No. 1, which was tested under the supervision of Mr. Macdermott. When the council of the Institute were all present the signal was given for this machine to start. After working for a stipulated time of one hour it was found that a hole was cut 2 ft. 6 in. in depth by 2 ft. 3 in. in the face, and 3 in. in width, but this was not cut clear out to a right angle, for, as will be seen by the foregoing description, the cutter bar is on a centre, and the extremity of the cut is necessarily circular. The machine worked on an average about five minutes at a time, making as much as 4 in. at a time, but intervals necessarily occurred while it was prepared for a fresh cut. The whole time of actually working, exclusive of stoppages, was about 41 minutes 6 seconds.

No. 2, the invention of Mr. R. S. NORRIS, was next tested. This machine, which requires a clear space of at least 8 ft. from the face of work, was set to work, and after being in operation 30 minutes had drilled a hole 2 ft. 8¼ in. deep by 9½ in. on the face, and 3½ in. thick. The drills were then withdrawn, and a test was made as to the actual time necessary to prepare the machine again for work, and this occupied 20 minutes. Through some want of preparation only three drills worked, but Mr. Norris stated six could have operated, doing double the length on the face, with very little additional labour. Four men were required to work this machine, taking it in turns, two off and two on.

No. 3, the patent of Mr. SMITH, was exhibited in the pit, but it had not been perfected, and was not suitable for the hard seam of coal chosen for the contest.

The portion of the seam selected, "the benches," or bottom of the thick coal, was exceptionally hard in this instance, and it was generally acknowledged that if the machines that had competed could be made to work favourably in such a measure they would be suitable for any seam in the kingdom. The decision of the judges will not be given till about Sept. 7, when the next meeting of the Institute takes place.

THE LUNCHEON.—A company, numbering nearly 200, sat down to an elegant cold collation in a marquee on Barrow Hill, which is only a short distance from the Old Park Colliery. A more charming spot it would be difficult to find within the boundary of our island, commanding as it does a marvellous panorama, which includes not only the busy district around the Dudley coal field, but the more distant Wrekin, the Clee Hills, the Malvern Hills, the Abberley Hills, and the Clent Hills. Close by was pointed out the site where the famous Dud Dudley established his first iron furnace, in 1662. The repast, which was provided by Mr. Bourne, of Dudley, was served in a style which elicited general commendation. Mr. Field, president of the council occupied the chair. After "The Queen" had been given from the chair, and duly honoured,

Mr. JEFFRIES said he had the pleasure of proposing the next toast, which might almost be considered the toast of the day. It was that of "The South Staffordshire and East Worcestershire Institute of Mining Engineers." Personally, as well as representing a very large establishment in the absence of his chief that day, he (Mr. Jeffries) did not hesitate to say he was proud of the existence in that district of this Institute. And more than that, he was proud of and pleased with the occasion of their being brought together. He considered that not only the members of the Institute, but every right-thinking man must sympathise with this attempt to introduce coal-cutting machines—the object being to assist and not to supersede colliers' labour. Everybody, he thought, would not only hail the introduction of these machines, but would patiently wait for their being improved and perfected, not to supersede, as he said before—(he made a point of that)—but to assist the colliers' handiwork. He was not about to anticipate the decision of the council with regard to the machines which had been tested that day. It would not be for him to attempt such a task, even if he were capable of it. But in his own humble judgment there was merit in all three of the machines which had been exhibited. Of course, the difficulty lay in the labour. It must, he thought, be admitted, from what he had seen, that manual labour was after all over and above everything. (Hear, hear.) He desired personally to offer a few words of encouragement to those gentlemen who had come forward to put their machines to the test. He thought they had shown pluck, and he also thought they had shown judgment, in what they had devised up to the present time. Each of those machines, he believed, represented the nucleus of a perfect machine; and he hoped these and other inventors would go on until they succeeded in producing a machine which should not be the enemy but the helpmate of the collier. (Cheers.) He considered that it was in such things as this that an institute like the one with which they were connected could be useful. It was intended that their institute should have a practical tendency; and he thought there was nothing more practical to which they could direct their attention than the proceedings of that day. In proposing the toast of "The South Staffordshire and East Worcestershire Institute of Mining Engineers," he would couple with it the name of its president, Mr. John Field, a man who was deservedly respected throughout the district, and who would not allow the Institute to suffer under his presidency. (Loud cheers.

Mr. FIELD, in returning thanks, said he could endorse all that had fallen from the last speaker in regard to the Institute, which it was desired should be useful. They never intended that it should be an institute in name only. Their object was to benefit succeeding generations, and he thought they had taken a step in that direction that day. Men were complaining that they were worked too hard, and the object was to relieve them of that excessive toil. If this could be done with the aid of machinery a good work would have been accomplished. The machines they had seen that day, although not perfection, showed them something beyond what they had witnessed before. As one of the judges, he might be permitted here to mention that the decision stood adjourned to a future day, some three weeks hence. They would then hear which was considered the best machine. He thought great praise was due to all the exhibitors, even if their machines were not all that could be wished. Those gentlemen had found the coal of this district stronger than they had anticipated—(hear, hear, and a laugh)—but (said the speaker) the stronger we find it the better we like it; it makes less slack. (Cheers.)

Mr. H. JOHNSON was called upon for the next toast, that of "The Patentees." It was unnecessary, he said, that he should remind those present of the difficulties that patentees laboured under in bringing out new inventions, more especially when a large portion of the trade of an important district was likely to be affected by their success. In this instance, however, he believed the mining population would cheerfully yield to the introduction of machinery. As Mr. Jeffries had remarked, the object of these coal-cutting machines was to reduce the enormous waste of physical labour, as well as to economise the produce of the district. The patentees represented on that occasion must have had great trouble in bringing their machines to the state of perfection already attained. He would not say a word as to the merits or demerits of either of the machines, but he believed that every man had done his best, and he understood the result would be made known on Sept. 7. Mr. Spruce, who had so ably conducted the arrangements of the day, had given the competitors a piece of coal for their operations apparently selected upon this principle—that the greater included the lesser. (Hear, hear.) If those gentlemen could make machines to cut by hand the coal Mr. Spruce had put before them there could be no doubt of their ability to cut any other coal in Great Britain. (Hear, hear.) Therefore, if it should be thought that the machines they had that day seen in operation did not meet every requirement, it would not do for the Institute to withhold the premiums on that account. After a few other remarks, Mr. Johnson concluded by submitting his toast, in which he included Mr. Gratton Jones, Mr. Macdermott, Mr. Norris, and Mr. J. E. Smith. (Cheers.)

Mr. JONES acknowledged the compliment. He alluded to the enormous output of coal in this country, amounting last year to no less than 123,000,000 tons; and anticipated that by the application of machinery a very material addition would be made to the wealth of England. Speaking of the hardness of the coal upon which the machines had operated that day, he said in another part of England he had been able to do from four to six times the amount of work. Still an illustration had been given of what might be done by the application of machinery. (Hear.)

Mr. NORRIS freely endorsed the observations of Mr. Jones. The patentees were somewhat in the position of a proud mother—their little bantling had that day got out of the arms of the nurse; it had got into its go-chair, if not upon its legs. (Laughter and cheers.) The coal found at Dudley had surprised him. If a hand machine could cut that they might as well put it to cut cast-iron. The soft coals of Lancashire could be cut by machinery to pay well. He intended to perfect his machine by substituting air power for hand labour. He would condense the air in properly made cylinders at the top of the pit, and send them down one, two, or three at a time in an empty coal wagon, and that wagon would come back loaded with coal cut by the machine. This he would promise confidently; and he would prophecy that before long such a machine would be made to work the heavy hard coal of this district. There was a good time coming, only wait for it. (Cheers.) Mr. Norris bore testimony to the kindness of Mr. Spruce, than whom no one could have rendered greater assistance with more willingness. (Cheers.)

Mr. W. B. COLLIS said he had a toast to propose which he was sure would be cordially accepted—it was "the health of Mr. W. Spruce"—a gentleman well known not only for his practical experience and his professional ability, but also on account of his accessibility and courtesy to everyone who had to approach him. It was to Mr. Spruce that the pit arrangements of that day had been entrusted, and to whom they were indebted for the great comfort and ease with which they viewed the experiments in coal cutting, so unique to most of them. (Cheers.) He (Mr. Collis) dilated upon the advantages which may be anticipated from the application of machinery to coal cutting, and said he had given Mr. Macdermott an order for one of his machines, in order that he might thoroughly test its capabilities. (Cheers.)

Mr. SPRUCE returned thanks, and adverted to the responsibility which he felt devolved upon him in making arrangements for the experiments witnessed that day. He understood there were six or seven machines coming, and he was anxious so to place them that they should not only be seen by the visitors, but that all should have fair play. In the first instance, he had prepared two pits in the Himley Colliery, where the coal was much easier for cutting than that which had been operated upon, but he found they were not adapted to the occasion. He was naturally anxious about the safety of the visitors, and he did not wish to take them far from the bottom. This was the reason No. 58 Pit had been fixed upon. He (Mr. Spruce) hoped these coal-cutting machines would prove a success, for he felt that such things were a step in the right direction. The inventors must not be disheartened by a bit of hard coal such as they had encountered that day. (Hear, hear.) It was any consolation to them, he might mention that he could send some coal half as hard again as that which had been put before them. (Laughter and cheers.)

Mr. THOMAS PARTON proposed "The Visitors," coupling with the toast the name of Mr. Samuel Griffiths. (Cheers.)——Mr. GRIFFITHS expressed his sense of the compliment paid him, and anticipated that the time would come when coal-cutting machines would supersede manual labour. He was right glad to find the old Black Country inaugurating such an important invention. (Cheers.)

Mr. LINDOP gave the last toast, "The health of the secretary, Mr. H. Johnson, jun.," who was eulogised as a worthy successor of his father. Mr. George Spruce was connected with the toast, and it was then drunk with applause.—Mr. H. JOHNSON briefly returned thanks, assuring the company that what he had done was a labour of love.—*Wolverhampton Chronicle.*

COMPRESSED FUEL.—Prof. HAHN, of Bloomsbury, has patented some improvements in the manufacture of compressed fuel, and in apparatus therefor, and for other like purposes. The inventor says—"My said invention relates chiefly to the manufacture of compressed fuel from coal dust. I use a double-chambered baking or heating oven, constructed for the reception of pans for holding the materials being treated. The coal dust or small coal is first mixed with a small percentage of ground pitch or other like material, and put into these pans,

which pass into the oven, whence the mixture is taken to moulds connected to endless chains, which pass over wheels one above the other, and compress and deliver the material. The aforesaid moulds open upon pivots. An important feature of my invention is the obtaining of the necessary power from the weight of the coal or other materials in the moulds."

Meetings of Public Companies.

BRYNMAWR COAL AND IRON COMPANY.

The half-yearly meeting of shareholders was held on Wednesday, at the London Tavern, Bishopsgate-street,—Mr. T. GRATREX (the Chairman of the company) presiding.

From the statement of accounts it appeared that 198,840*l.* on shares and 50,000*l.* on debentures had been received on capital account, and that in addition to the purchase money paid to the vendors 12,300*l.* 9s. 6d. had been expended on new cottages, works, and machinery. After writing off all preliminary expenses, setting aside 3000*l.* towards depreciation of plant and providing for debenture interest, and an interim dividend paid in February last, the balance remaining to credit of profit and loss account was sufficient to pay a dividend at the rate of 10 per cent. per annum, leaving a balance of 274*l.* 15s. 3d. to be carried forward to next account.

In their report the directors referred briefly to the great fall in the value of coals in South Wales, and the disparity existing between present prices and the high rates of wages, expressing their opinion that further reductions of wages must speedily take place. The adoption of the report and accounts was moved by the CHAIRMAN, seconded by Lord WILLIAM PHIPPS, and unanimously agreed to.

A resolution declaring a dividend of 6s. and bonus of 4s. per share (equal to 10 per cent. per annum) was, on the motion of the CHAIRMAN, seconded by Mr. W. H. COOKE, Q.C., also unanimously passed. The retiring directors, Mr. Gratrex and Mr. Benham, were re-elected; and the meeting terminated with cordial votes of thanks to the Chairman and the managing and other directors.

NEW SHARLSTON COLLIERIES COMPANY.

A meeting of shareholders was held at the City Terminus Hotel, on Tuesday, Admiral HORNBY in the chair.

Mr. S. M. ROBINS (secretary) read the notice convening the meeting.

The report of the directors stated that the Articles of Association provided that the ordinary general meetings shall be held annually. The first was held on Feb. 17. Having regard, however, to the desire expressed by some of the shareholders that they should be called together half-yearly, the directors have called an extraordinary general meeting, in order that the proprietors may know what progress has been made in carrying out the operations of the company, and how far such operations have been affected by the unfavourable change which has taken place in the coal trade since the company obtained possession of the property. From Nov. 20, 1873, to June 30 the output was 89,097 tons, or an average per working day of 473 tons. This falling off in production has been caused by the unsettled state of the labour question, the pit being idle during 26 entire working days, and partially standing on many other occasions. The price has fallen considerably since the close of 1873, in consequence of which the directors were compelled to give notice of a reduction in wages. The matter was ultimately referred to arbitration, and an award was made of 12½ per cent., to take effect from March 31 until August 10. This, however, is inadequate, having regard to the great fall in prices; and, unless the coal trade improves, a further reduction in wages must be made. The diminished output and fall in prices have together unfavourably affected the returns up to June 30, to which date the accounts have been prepared and audited. Upon the working of the collieries there is a gross profit of 11,798*l.* 13s. 10d., from which has to be deducted interest on mortgage and London charges, leaving a net balance of 4308*l.* 0s. 5d., out of which the directors recommend an interim dividend on the preference shares at the rate of 5 per cent. per annum. The efforts of the board have been continuously directed to increasing the output, and considerable progress has been made with the new works. Some time, however, must still elapse before the new hauling and ventilating engines can be erected and in working order; but on their completion, and that of the underground works, the present daily production should be considerably increased.

The CHAIRMAN regretted that the board had not been able to recommend a larger dividend, but the cause could be clearly explained. It had arisen from three causes—a small output, a great and increasing fall in the price of coal, amounting to 50 per cent., while the reduction in wages had been for part of the time—that is, since March—only 12½ per cent. The average output per working day had been 473 tons, but taking the actual number of working days the output had been 571 tons. The reason the output had not been greater was owing to strikes, as well as any excuses which the colliers could make for not working; and it had been openly proclaimed—he thought unwisely—that the way to keep up the price of coal was to restrict the output. A restriction of output was a most sensible loss to the colliery and the shareholders, and for this reason—the men were paid for the actual amount of coal got out, while the expenses in the pit must go on whether the output is small or otherwise. If in one fortnight they got 5000 tons, and another week 6500 tons, there would be a reduction at once of 2s. 6d. a ton in the expenses; he could not give a better instance of how a restriction of output affected the interest of the company. The wages of colliers had advanced 79¾ per cent. since 1870, while the prices of coal had fallen 50 per cent. since this company had acquired the colliery. This, of course, had very much reduced the profits, but he found other collieries, with very few exceptions, had been doing exactly the same thing—working at a very small profit. The result had been that they had not made the very large profit they were making for the first five or six weeks, but if the price of coal had continued as it was at the latter part of last year they would have been able to pay 30 per cent. But since December the profit had largely diminished, and they had to pass through a very bad time, the state of trade being as bad as it could possibly be. The net profits had been 6608*l.*; as stated in the report, it had been a question with the directors whether or not the sum of 2309*l.*, the amount allowed as discount on calls, should be placed to the revenue capital account. It had been placed to capital, because there was a difference of opinion, and to that fact attention had been drawn in the report. As the accounts now stood, they would be able to pay a dividend at least of 5 per cent., or 8s. per share, carrying over 1500*l.*, but if, on the contrary, the shareholders preferred to carry the sum of 2309*l.* to revenue, the dividend would be 11 per cent., or 6s. per share. He should mention that by allowing that discount to the shareholders possession of the property had been obtained at an earlier date, and that a profit had been made in the meantime; he should also state that the cost of maintenance had been defrayed out of revenue, and he believed, with the exception of some boilers, the whole of the plant was in a very good state of repair. When the new machinery had been completed they would be able to largely increase the output, especially as he believed the trade was reviving, and would revive. The management expenses had been reduced by 1300*l.* per annum, and after the end of the year he looked to a very large increase of output, and he hoped and trusted the New Sharlston Company would be a very successful affair, and a good paying enterprise. Its drawbacks were—the water was not good, the roof was not good, and the coal was inclined to be soft; but, on the other hand, it was one of the best ventilated coal mines in the district, and produced gas coal of a very superior quality, which they were now selling, and hoped to sell more; and they had also erected coke ovens by which the "smudge" or dust coal would be utilised, which they had been selling at 3s. per ton; 2 tons of this made 1 ton of coke, and he had been told there would be no difficulty in getting rid of as much coke as they could make, by which a good profit would be realised. It was important to mention that each director had paid for his shares, and stood exactly in the same position as any other shareholder. He had joined this company simply because a great many of his friends had joined it, and because he had been misled by the hope, as others had been, that the price of coal would continue good. He had taken the chairmanship because he had been solicited to do so; he had nothing to look to in the future beyond the smallest shareholder; and his name was too precious to him to do a dishonourable thing. He was constantly at the colliery or at the office, and there was every reason to believe they had a good staff of officials. He had full confidence in the management and secretary, as had the whole board of directors. He then moved that the report and balance-sheet be received and adopted.

Lieut.-Colonel HOLLAND, C.B., seconded the proposition.

Mr. WHITEHEAD said he represented nearly the whole of Yorkshire, who had unanimously passed a vote of want of confidence in the present board. He called upon the board to resign. Their remuneration was excessive—1000*l.* per annum, and 3d. for every ton raised. He proposed that this meeting do not accept the accounts or report, and that for economy the board resigns, and that a local board be appointed that will meet at the colliery, and control the management. He had no hesitation in saying that by adopting this course they would save 10,000*l.* a year.

Mr. R. PICKLES (Wakefield) seconded the amendment.

Mr. HINDLE (Leeds) said it was very unpleasant to hear such remarks against gentlemen in whom they had placed confidence, and asked what remuneration the board had actually received, and was it true the manager received 700*l.* a year?

The CHAIRMAN said that what the directors received, was settled by the Articles, They met nominally every fortnight, but really much oftener.

Mr. NELSTROP said that, contrasting the statements in the prospectus with the results actually realised, the directors ought to take into consideration what could be done to reduce the charges of management.

The CHAIRMAN, in reply to a question, stated that the manager did not receive 1d. per ton, and had not received it. The board were anxious to reduce the expenses as much as possible, and he had applied to Mr. Jeffcock, who was well known in Yorkshire, to point out what course should be adopted to ensure that end.

Mr. NELSTROP supported the proposal that the directorship should be held in the neighbourhood of the colliery, as the Yorkshire shareholders were determined the expenses should be reduced.

Dr. EMMENS contended that as practical men of business the shareholders must allow the consideration to weigh that the board of directors, possessing the confidence of the shareholders, had conducted the affairs of the company through a most critical period—those gentlemen were justly entitled to a little fair play, as they had been actuated by honest motives. He was sure they would only be too happy to be aided by the counsel of shareholders if it could be shown to be for the interest of the company. The prospectus held forth that a profit of 2s. 6d. per ton might reasonably be expected. If they took the output actually made and compared it with the amount actually realised they would find the profit had amounted to 2s. 8d. per ton—that was a fact which ought not to be overlooked. As the rate of profit realised had been greater then than that held out the disappointing dividend must be attributable to some other cause than that affecting the rate of profit per ton—that, to his mind, was a complete justification of the management of the company. (Hear, hear.) The lessened dividend arose from a decreased output, which was entirely out of the control of the directors, and solely attributable to the action of the colliers and the state of trade. Shareholders would be acting far more in their own interest if they co-operated with the directors and assisted them in putting the affairs of the company upon a sound footing, and supporting them by showing that they had confidence in their honour and integrity.

Col. GOURLEY, M.P. (a director), said that when he joined this colliery he fully believed the coal trade would continue good. In that he had been disappointed. As to the directors' fees, he was quite ready to hand over the small amount he had received to the credit of the shareholders. He had no wish to have it said he had ever received any sum to which he was not justly entitled. (Hear, hear.) If the shareholders could themselves manage the property more profitably than it had been managed he, as an individual, was perfectly ready to place his seat at their disposal.

Mr. BARNETT had no doubt that as the colliery was earning less than its ordinary 10 per cent., the directors would forego the 2d. per ton, and suggested that two or three of the largest shareholders from Yorkshire should seek an interview with the board to state what they believed should be done for the interests of the company.

Dr. HOLLINGS (Wakefield) considered they paid their manager too high a salary, and that the directors' fees were enormous. He supported the proposal that the business of the company should be conducted at the colliery.

Mr. ASPINALL (Halifax) suggested that some three or four shareholders should be nominated to confer with the directors. He did not wish the directors to resign, but if they could add to their number some local men it might improve the condition of the colliery, and also give satisfaction to the directors.

Mr. GOULD thought some local shareholders should be added to the board, or that a local committee should be appointed to co-operate with the board.

Mr. MOY, as a large shareholder, and largely connected with the coal trade, was of opinion that the Sharlston coal would realise a better price at this moment, and had for the past six months, than any coal of a similar quality. Within the last six months he had bought New Sharlston coal as high as 24s., and as low as 14s. per ton. He had known the manager some time, when he was connected with the Clifton Colliery, and could testify to his efficiency. He should support the proposition for the appointment of a committee to confer with the directors.

Mr. CLENCH said if some practical gentlemen in London would co-operate with some Yorkshire shareholders five would be amply sufficient for all practical purposes. It would be useless for this meeting to attempt to deal with these matters in detail. Whatever they did, do not let them lose sight of the fact that they possessed a valuable property, requiring only economical and practical management to produce satisfactory results.

Mr. EDWARDS had known the property for many years, and believed it to be a valuable one. His advice would be—by all means hold on to their shares, as he had no doubt they would come out with good dividends in the course of a year or so. But they must have a committee of Yorkshire friends—men who would take the thing up coolly and deliberately, sparing nothing that was wrong, but conciliate with the board and get them to act with them, and let that committee report what they had done.

The CHAIRMAN would be only too glad if such a a committee were appointed, as it would relieve the board extremely. He was most anxious to reduce the expenses, and he would ask the meeting as a favour to request a number of shareholders to form themselves into a committee for the purpose of seeing what improvement could be made in the management. Feeling dissatisfied with the expenses, he should like to be empowered to get five gentlemen to assist him to see whether some improvement could not be struck out.

After some further discussion the amendment was withdrawn, and the resolution adopting the report and balance sheet was received and adopted, and the dividend of 5 per cent. declared.

It was unanimously resolved that a committee be appointed to confer with the directors and managers with the view of effecting reductions in the management of the company, and what improvements could be made in its administration. Dr. Hollings, and Messrs. Whitehead, Aspinall, Moy, and Booth were nominated as the committee.

The CHAIRMAN, in referring to the point raised during the discussion, said he did not know who appointed the manager, but if he did not think he was doing his duty he would be the first to get rid of him. There was every reason to believe he was a very efficient manager. As to the purchase-money of the colliery, it must be remembered that of the amount paid, 110,000*l.* was in deferred shares. The Articles of Association provided that the registered offices of the company should be in London; and as to the expenses, he stated that instead of paying 750*l.* per annum for clerks, office, &c., they now paid only 360*l.*

Mr. TATHAM (the solicitor) explained that the company had been legally released from all liability in respect of the royalty on the 300 acres of land, referred to by one of the shareholders.

A vote of thanks to the Chairman and directors closed the proceedings.

ENGLEFIELD COLLIERY COMPANY.

A general meeting of shareholders was held at the City Terminus Hotel, on Wednesday,—Lord RICHARD H. BROWNE in the chair.

The report of the directors regretted that the working of the colliery for the past twelve months had been so far unsatisfactory that they are unable to declare any dividend. At the first meeting the directors proposed that the operations should be limited for the present to the development of the existing colliery, fitting it with additional and suitable machinery and plant, and placing it in a position to yield from 1000 to 1500 tons per week. This course was approved by the shareholders. Under the advice of their engineer they hoped that the Three-yard seam, from which these results were chiefly expected, would have been cut by the works they undertook in about six months, and that the estimated output would have soon followed; but this operation has taken much longer, the seam being cut on May 29. But although this delay has been most unfortunate, inasmuch as it has prevented the possibility of a present dividend, the year's working has more than justified the high opinion that was formed of the value of the property. Certain errors in the maps of the vendors, which misled the professional advisers of the company in their estimate of the immediate returns to be obtained from the Badger, Yard, and Four-feet seams before cutting the Three-yard seam having been corrected, it appears that a greater area of this latter coal than was expected can be worked from the existing pits. There seems no reason to doubt the correctness of the engineer's estimate, that the amount of coal available for working from the present colliery is far more than sufficient to last the term of the lease.

The delay has, doubtless, caused great disappointment to the shareholders, but the directors feel that they are justified in believing that the prosperity of the company is but deferred. The position of the fine seam now being opened was accurately calculated, and, therefore, there is every reason to feel confident that the positions of the other seams, which it is intended to cut in succession, are known with equal accuracy. A source of great regret to the directors, which also arises from the works of development having occupied a longer period than was originally estimated, is the increased cost of these works, and consequent exhaustion of the subscribed capital. It is believed, however, that but a comparatively small sum is required to complete all works at present contemplated, and the directors desire to point out that this will have been accomplished by the issue of capital little more than half what was originally invited, and, consequently, the value of the existing shares will be commensurately larger.

The report of the engineer (Mr. T. L. Cottingham) stated that it is now twelve months since he undertook the engineering management of the Englefield Colliery. The chief work has been the driving of an engine plane or incline in the Badger coal, nearly 400 yards, in a north-easterly direction, to win the Three-yard coal; of this plane nearly 200 yards had been driven by the former proprietors, but as it was very crooked, and not large enough for the requirements of a large output, it had to be straightened, widened, and timbered before it could be further driven, and this work took much time, money, and timber; however, it was thoroughly well finished, and was then carried down to the point from which it was deemed right to commence a cross-measure drift to cut the Three yard coal. It cut the Three-yard coal on May 29, and we are now pushing out with all speed levels north and south to prove the No. 1 fault. The necessary return airways, overcast, and appliances for the efficient ventilation of this seam, in conjunction with the Badger, are completed, and work well. The Badger coal has been opened out, and the lower portion of it, 1 yard thick, is producing a fair quantity of very good coal; this production will increase regularly; there is above this coal a seam of excellent fire-clay, 5 ft. thick, which will produce very good bricks, tiles, pipes, &c., and can be economically worked, and should not be neglected. An engine plane or incline which was being driven down in the Yard coal between the faults has been repaired, and has reached the No. 2 east fault. The Yard coal is being opened out and worked from this incline; it looks very well, and will in about six weeks produce 200 tons per week. A deal of money has been expended in enlarging and repairing airways, cleaning water lodges, repairing pumps, &c.; these are now in fair order, and a small occasional outlay and constant care and attention will in time perfect them and keep them good. Circumstances beyond control, chiefly the difficulty of getting the machinery, &c., delivered in time as per contract, owing to excessive demand and restriction of labour, to the general falling off in miners' labour by reason of Trades' Unionism, and the provisions of the new Mines Regulation Act, caused the estimate of time, outlay, and output to be exceeded; all are painfully aware that such delays occur in all undertakings, mining especially; however, the work has been well done, and the best results expected will doubtless speedily accrue. Depend upon it all the officers of the concern will do their utmost to bring about this most desirable state of affairs. They estimate the total cost of the Three-yard coal at surface when in full work, with an output of 120 tons per day, at 6s. per ton, and the average selling price at not less than 10s. 6d. per ton.

The CHAIRMAN said that the reports of the directors and manager really contained all the information they had to communicate as to the position and prospects of the colliery, and the balance-sheet fully set forth its financial position. The works had been much retarded by the repeated strikes that had taken place, and, indeed, one was prevailing at the present time, and a vexatious delay had also arisen by the failure on the part of the contractors to deliver the new engine at the time stipulated. He then referred to the different works in progress at the colliery as detailed in the report of the manager, and moved that the report and balance-sheet be received and adopted.—Mr. WINGROVE seconded the proposition.

In reply to questions put by several shareholders,

The CHAIRMAN said that the debt to which he had alluded was chiefly on account of stores supplied during the last six months—the actual amount was 1735*l.* The board proposed to issue debentures to the extent of about 4000*l.* or 5000*l.*, and negociations were now in progress for that object.

Mr. COTTINGHAM (the engineer) explained the different workings, and confirmed the statement of the Chairman that the progress of development had been seriously retarded by the strikes, and added that the cost of the new siding would be something like 2000*l.*, or double the amount originally anticipated, in consequence of the refractory conduct of the London and North-Western Railway. The colliery, in his opinion, at the present time was not paying its expenses, but an output of 500 to 600 tons per week would enable them to do so.

Mr. JONES (the manager) referred to the immense trouble they had had with the men, but anticipated an early solution of the difficulty.

The report and balance-sheet were received and adopted. The retiring auditor was re-elected.

A vote of thanks to the Chairman and directors closed the proceedings.

ENGLISH AND AUSTRALIAN COPPER COMPANY.

The half-yearly general meeting of shareholders was held at the London Tavern, on Thursday,—Mr. ROUTH in the chair.

Mr. C. B. ROGERS (the secretary) read the notice convening the meeting. The report of the directors (which appeared last week) was taken as read.

The CHAIRMAN, having referred fully to the salient points in the report, stated that the few remarks he was about to make would induce shareholders before leaving the room to be more satisfied than when they entered it. When he had the honour of addressing the shareholders in February the price of copper was 93*l.* per ton, from that it fell to 83*l.*; and although we sold our copper to the best advantage, we found that we had not made the profit we should otherwise have done, and I need not tell you upon the stock we held that a difference of even 5*l.* is a serious matter, whilst 10*l.* a ton represents all the difference between profit and loss. At the last meeting he gave it as his impression that the price would improve, and he knew that was the opinion of several large holders in the City of London, but they, like this company, had not succeeded in making any profits during that period. The exports of copper, iron, and coal had fallen off over 10,000,000*l.* during the 10 months ending July. The United States had taken less by 4,000,000*l.*, Germany by 1,500,000*l.*, Holland by 1,000,000*l.*, Belgium by 800,000*l.*, and other countries by 250,000*l.* Therefore, it should not surprise them that a copper-producing company should have suffered when a difference in the price of 5*l.* per ton made a difference of 7300*l.*, and 10*l.* per ton no less than 14,700*l.*, in their profits. On the other side, the supplies and the work done had been exceedingly satisfactory; indeed, the supplies of ore had been nearly double the quantity they had ever before, and if the price had continued anything like reasonable they would have had a very large profit upon this occasion. During the low prices they had laid in a good stock of ore, and there was every reason to suppose the current six months would show a very considerable improvement. This time last year the accounts showed a deficiency of 6000*l.*, and in February last the position had so improved that they were able to pay a dividend, and he had no hesitation in saying that next year they would again be in a position to give a dividend. Some delay had arisen in sending ore from New Caledonia, so that they had not yet had the benefit of those discoveries, of which a great quantity was now at grass, waiting for the completion of the road to the port, which it was calculated would be made in about three months. As soon as finished the ores would be shipped. This enormous quantity of ore was entirely independent of all other sources of supply, and at better prices than before, contracts having been signed for delivery at Newcastle. An extension of the works had become necessary, because the supplies of ore were greater than they could smelt; and it was important to note that in making new works a great deal of copper was for the time lost in the saturation of the furnaces—in fact, from the reports received from the other side, a great deal of that which should have come to them during the past half-year in the shape of profit had been for the time taken away by the saturation of the furnaces. When those furnace-bottoms were taken out the advantage and benefit of that saturation would be derived. It was important to them that they should have a sufficient number of furnaces, because otherwise a rather heavy stock of ore accumulated. The great object was to keep their floors as clear as possible, so as to turn the ore into copper as speedily as they could. They had hoped to have sold a great quantity of copper in the Indian market. They telegraphed to their manager in Adelaide to at once ship to India, but he could not possibly get freight; had freight been then obtainable they would have realised the best prices, and now be in a much better position than indicated by the accounts. They knew it was a very limited market, but at the same time had hoped to have sold 300 or 400 tons. He should not omit to mention, too, that the first half of the year was invariably not so good as the second half, and for this reason—that they could not have a clean stock-taking. The manager in one of his reports refers to this, stating that this half yearly stock-taking was a most unfair thing, because there was a great deal of ore *in transitu*, and the exact value of the copper from the furnaces could not be told till the furnaces had been let out, which was not done until the end of the year. It was, however, invariably the case that at the end of the year better results were shown than indicated at the end of the first six months. As to the copper market, there had been large supplies, and the price had declined. The spring demand, always looked for, never arose, as shown by the exports. This was especially the case with regard to Germany, hitherto one of their best markets. But he was firmly of opinion the price had seen its lowest. During the last week it had a little hardened; but, supposing there was no advance, considering they would have the benefit of buying ore at the low prices, he thought he could safely promise shareholders a better half-year than that now under consideration. He could congratulate them upon the fact that the company was in a sound and firm position, and that the manager was doing all that could be desired to ensure successful results. (Hear, hear.)

Mr. E. WRIGHT said that as a matter of fact they knew they had been passing through a period of very great depression, when all trades, more or less, had suffered, and this company had no reason to expect better results than their neighbours. He thought the Chairman was always rather too hopeful, but still he (Mr. Wright) hoped his anticipation of the future would be realised. He took it that if the supply were increased the price must come down.

Mr. COBBETT said that population and the demand were increasing in the same proportion.

The CHAIRMAN said that while there were many sources of supply, at present the demand has exceeded the supply. It is quite possible that the reverse might be the case, but then, of course, the price of ore would fall in proportion, and we would be in as good a position as anyone who came into the market. It was the first time he had the pleasure for 15 years of being able to announce that all the furnaces were at work, and more were wanted.

Mr. BRICKWELL thought the directors had made the mistake which many others had done—of holding copper when they saw the market against them.

Mr. SPENCER HERAPATH said that while a company like this required the continual attention of the board, and certainly no board did its duty more conscientiously and thoroughly, the present disappointments arose from circumstances entirely beyond the control of the directors. He reminded the shareholders that without calling upon them for 1s. additional capital, the company had divided profits to the extent of 70,000*l.*, besides accumulating a reserve fund of 10,000*l.* (Hear.)

Mr. SANGER said that as the directors were large holders, they might rest perfectly satisfied that everything was being done for the best interests of all concerned. But the directors could not be like so many Joshua's, and say to copper, "Stand still," and not go down. (Laughter.) The directors could not command success, but he believed they did all in their power to merit it.

Mr. JAMES said, as the broker of the company, possibly no one was a better witness than himself to the anxiety of the directors as to the course of the copper market, and that the best prices should be realised. He had an experience in selling the Burra copper for 16 years, and he could testify to the fact that the course the directors pursued was now the safest that could possibly be devised—they sold continuously, never largely, but always sellers at the best price that could be obtained. The condition of things in 1872 completely upset all calculations, when copper rose 30*l.* per ton in a few months. These periods of speculative excitement seemed to induce the belief that higher prices were to be permanent, but values declined before the produce actually *in transitu* had arrived. When they could sell "to arrive" they had always availed themselves of the opportunity, but for a long time past they had only been able to sell from day to day, and there was no such thing as anticipation—therefore, they must stand the "racket," so to speak, of the period between the purchase of the ore and its arrival in the shape of copper

is this country, and that was a very long period. If carried on for a period of years it must come round, and prove quite as profitable as if the works were near London.

Mr. Schofield asked if the unfavourable results had not arisen from the ore having been purchased at too high a price, and whether there was any control over the manager as to the price he paid?

Mr. Frewer (a director) said the board had hoped that by the efforts continually being made, assisted by the manager, the company before this would have been placed in a permanently paying condition, but circumstances beyond their control had thus far prevented it. As to the price paid for the ore, every parcel was subject to tender, and they had to tender against another and a powerful company, and on many occasions their manager, desirous of securing a proper supply at low prices, had lost valuable parcels by tenders ½d. or 1d. less than his powerful opponents. The board were now endeavouring to sell on this side about the same quantity of copper that was being made, so that at no time they should become overstocked. They were now getting rid at current prices of the produce bought, and which they were compelled to buy at very high prices, which ruled some time ago; but looking at the fact that they had made large purchases at low prices, and they were just on the eve of receiving ore from New Caledonia, where they had no opposition, he could not help feeling—at all events he should be excessively disappointed if it were otherwise—that upon the next occasion the accounts would show a better balance than they do now. Under any circumstances, however, the directors could not do more than they had done during the past six months.

A vote of thanks to the Chairman and directors closed the meeting.

MEDLYN MOOR MINING COMPANY.

A general meeting of shareholders was held at Mr. Granville Sharp's offices, No. 2, Gresham Buildings, on Wednesday, Mr. Hilton (one of the largest shareholders) being voted to the chair.

The notice convening the meeting was read by the manager, in the absence, through ill health, of the purser (Mr. Oliver Matthews).

A statement of accounts was submitted, made up to Aug. 9, which showed a debit balance of 894*l.* 2s. 10d., after charging twenty-eight weeks' labour cost, and seven months' supplies.

Capt. Rowe stated that it was at his request the second paragraph in the notice convening the meeting was inserted, to the effect that he would be present on the occasion, wishing to give the shareholders in and near London the opportunity of meeting him, that they might question him as to the state and prospects of the mine, for they had arrived at a point necessitating the erection of a larger pumping-engine.

Mr. Granville Sharp was sorry the accounts should have gone on so long without a meeting being called, and no doubt one would have been but for the contracted illness of the purser. He was, however, glad to find the accounts were so closely brought up.

In reply to the Chairman, Capt. Rowe explained that the tin was of a very fine quality. It was first-class tin, its produce being 13¾, and he expected it to improve in depth to (say) 14¾ in 20, or over 70 per cent., which is as high a produce as any tin in the county. He was quite confident the lodes would "hold" in depth, and had no hesitation in saying that he would be able to realise all he had predicted in his report.

A Shareholder asked Capt. Rowe whether, looking at all the circumstances, and at the present price of tin, he could see his way clear to make a profit?

Capt. Rowe: Certainly.

The following report, by Capt. James Rowe, was read:—

Aug. 19.—The time has come for an alteration in the mode and scale of working this mine, which will result greatly to the advantage of the shareholders. I will submit my views thereon, also a statement of the work done in opening out the lodes, and the discoveries made by which to understand the progressive position, present and prospective value of the mine, &c. I must, however, be allowed to offer a few preliminary remarks, which I don't think will be considered out of place. This mine is in a district celebrated as a great tin-producing one from time immemorial. In proof thereof I need only mention the old Wheal Lovell and Trevennen Mines of former days, and East Wheal Lovell, on one of the richest tin lodes ever found in Cornwall, with the well-kown productive Lovell and Trumpet Consols of the present day, which are a few only of the mines that have been abundantly productive in the immediate neighbourhood of Medlyn Moor. The grant, which is an extensive one—600 fathoms in length and 500 fathoms in width—comprises 20 lodes. At the time of the commencement of the present company's operations none of the lodes could be said to have been explored in any other than a very partial and ineffectual manner, with the little only done on them in depth; the trials made (very superficial) being those of the tin streamers, who in turning over the ground discovered the backs (surface outcrops) of the lodes. Some have been worked to the depth of 30 ft. by the aid of small wheels, but the fall of water being a few feet only, the trifling pumping power would not admit of deeper developments. Hundreds of pounds worth of tin have been got from them, there being an instance of a miner getting by working one of them to no greater depth than 30 ft., and for 15 fms. in length only, close upon 500*l.* worth of tin. Want of machinery to pump the water prevented his working deeper. Notwithstanding such trials and results, I considered the lodes not worked to a sufficient depth to justify the outlay for large pumping machinery, the lodes not being in settled ground, I concluded that it would be premature to put up a 40 or 50-in., cylinder pumping-engine before being fully assured that the lodes would prove productive enough to sanction it. Taking this precautionary view, I bought a small rotary engine of about 14-horse power, and placed it on No. 1 lode. We sunk a shaft 11 fms., and opened a level east and west on this lode, and found it productive beyond expectations. It improved in size and productiveness on deeper development, and we got between 3 and 4 tons of rich quality tin from it. I am very certain that this lode will be a much more profitably productive one at the next level. We found, however, that to sink deeper larger pumps were required, for which the present engine is not of adequate power. I, therefore, suspended the workings on this lode, No. 1, and went about 60 fms. north, sunk a shaft 6 fms. and met with another good lode, getting from it about 2 tons of tin. We drove the 6 fm. level 20 fms. west and 6 fms. east on this lode, being in several places not many feet below the workings of the old miners. The lode in the bottom of the level is 2½ ft. wide, worth from 12*l.* to 14*l.* per fathom. We should have further extended westward on this lode but for meeting with the old workings deeper than our level. I am fully satisfied that this lode is a valuable one, having proved it in settled ground, but the water being too much for our small engine, a suspension of the workings was unavoidable. I have no hesitation in saying that whenever it is decided to put up a larger engine, as proposed, the most advisable position for it is on this lode. There are three other lodes within a distance of about 20 fms. of this lode, one of which is said to be worked to a depth of 10 fms.; a small portion of the lode (left by the old miners) having produced 8 cwts. of tin. To carry on Medlyn Moor Mine to the best advantage, three or four lodes ought to be in action simultaneously, and a 40 or 50-in. cylinder engine will be of sufficient power to ensure their effectual development to the depth of 50 fms., and to a great extent. Our workings for the last five months have been in the northern ground about 80 fathoms from the lode last referred to. Here it has always been said that a productive lode would be found, and about a month since the shareholders were informed of the fact; a very good lode having been met with west of the new shaft. There is every reason to believe that this lode will prove a much more profitable one deeper, but I do not think the present system and limited scale of opening out the mine any longer advisable, which will only admit of one lode being worked. The trials made have proved most conclusively that Medlyn Moor is altogether free from a speculative character, admitting of no doubt whatever as to its being a very valuable property. I can positively speak to three lodes that will, even at the present low price of tin, on being effectually and simultaneously worked as proposed give good profits. On going 10 fms. deeper there will be three good lodes to work on (most likely four), there being, moreover, 10 others within the reach of the power of one engine. A good 50-in. cylinder engine will keep the four lodes drained, and with little, if any, more than the quantity of coals that the present engine consumes. The foregoing particulars explain the present position of Medlyn Moor. Therefore, what course of action will be most advisable is the question; which, although a very important one, is to be briefly and satisfactorily answered. I simply say that we have only to bring adequate machinery power, means, and appliances to bear on this mine, and open out the present discoveries a little deeper to prove the truth of all that has been said in its favour. The required expenditure (as per estimate) will not exceed 2500*l.* Medlyn Moor has advantages seldom met with, not the least of which is that the lodes are productive near the surface. There are no old deep workings to pump the water out of and keep drained, necessitating heavy first outlay and continued expenditure. The easy nature of the ground is another important advantage, saving much time and money in exploring it; and, no doubt, deeper it will stand without much timber. The lodes, although not large, make up for it in quality, which is a great advantage; many mines having to break and stamp a large quantity of lode produce to get a small quantity of tin. Lastly, I have much satisfaction in saying that I entertain a higher opinion of Medlyn Moor than I ever did, feeling assured that the small amount just stated is ample, judiciously applied, for erecting the engine and boiler houses, purchase of a thorough good 50-in. cylinder pumping engine, all the necessary pitwork and its connections for the three shafts for opening out a mine that will give unusually good percentage profits, as the workings will be exempt from the heavy expenses of deep mines. That Medlyn Moor is a very valuable property may now be considered an established fact.—James Rowe.

Capt. Rowe said a 50-inch cylinder engine would be ample to do the work of the mine, and enable the shafts already sunk on good lodes to be opened out for 50 fms. in depth.

The accounts were passed, and, with the highly encouraging report, were ordered to be sent, with the proceedings of this meeting, to the shareholders.

It was proposed by the Chairman, and resolved—"That a call of 5s. per share be made—3s. to liquidate the book debt, and 2s. on account of the purchase of a suitable engine and the erection thereof."

In consequence of the resignation of the purser through contracted illness, Mr. Granville Sharp was unanimously elected secretary to the mine.

A vote of thanks to the Chairman closed the proceedings.

WEST GODOLPHIN MINING COMPANY.

The general meeting of shareholders was held at the company's offices, Great St. Helen's, on Tuesday,

Mr. Robert Wilson in the chair.

Mr. Charles Thomas (the secretary) read the notice convening the meeting, and the agent's report, and the statement of accounts, showing a debit balance of 610*l.* 16s. 6d., were submitted:—

Aug. 15.—I beg to hand you the following report of this mine, with statement of work done since our last general meeting, and depth of the shafts and distance of levels from Pressure and Vivian's shafts:—Caunter Lode: At Pressure shaft we have completed the work required for sinking below the 50, and sunk the shaft 4 fms. 3 ft.—present depth 6 fms. 2 ft.; the lode in the bottom of the shaft is 2½ ft. wide, worth for the length of the shaft about 45*l.* per fathom; cost of sinking and securing the shaft about 40*l.* per fathom. The 50 has been driven south-east of Pressure shaft 4 fms. 3 ft. 4 in.; the lode in the present end is 18 in. wide, worth about 6*l.* per fathom, driving at 5*l.* per fathom, and distance from Pressure shaft 31 fathoms. The 50 has been driven north-west of Pressure shaft 10 fms. 4 ft. 3 in.; the lode in the present end is small, driving at 4*l.*; distance from Pressure shaft 21 fathoms. The 40 has been driven north-west of Pressure shaft 15 fms. 2 ft. 1 in.; the lode in the present end is 20 in. wide, worth 6*l.* per fathom, driving at 4*l.* per fathom; distance from Pressure shaft 47 fathoms. The 20 has been driven south-east of Pressure shaft 4 fms. 4 ft. 2 in.; the lode in the present end is 15 in. wide, worth 5*l.* per fathom, driving at 10*l.* per fathom; distance from Pressure shaft 76 fms. The deep adit level has been driven south-east of Vivian's shaft 2 fms. 4 ft.; the lode in the present end is 15 in. wide, producing saving work for tin, and looking kindly for further improvement. The lode in Vivian's shaft sinking below the deep adit level is 15 in. wide, worth 5*l.* per fathom, sinking at 13*l.* per fathom; sunk below the deep adit level 12 fathoms.—Pink Lode: The 50 has been driven east of the caunter 6 fms.; the lode in the present end is 15 in. wide, worth 8*l.* per fathom, driving at 10*l.* per fathom. The 50 has been driven west of the caunter 1 fm. 4 ft. 6 in.; the lode in the present end is 15 in. wide, worth 12*l.* per fathom, driving at 10*l.* 10s. per fathom. We have communicated the winze west of the caunter from the 40 to the 50. We have secured Cobbler's shaft, and erected a horse-whim on the same, and cleaned up the old workings below the deep adit level, and have set it to six men on tribute at 10s. in 1*l.* We cleaned up an old shaft about 200 fathoms east of the caunter on one of our lodes, but found the lode in the bottom of the shaft small, so I had this filled up again. Since then these men (two) have been clearing up a shaft on another lode further north, but about same distance east from Pressure shaft, and as far as we can judge from the old workings the old miners must have had a rich lode for tin here; the working is more than 4 ft. wide, and the wall now standing is mixed with lodestuff, which will produce a little tin, and the whole of the old stuff standing in the workings will produce a little tin, and the men have found some very rich stones of tin among the old stuff as they have been drawing it to surface. In addition to our tutwork operations, we have set on tribute four pitches to 12 men, at 5s. in 1*l.*, four pitches to 12 men at 10s. in 1*l.*, and 14 pitches to 21 men and two boys at 11s. in 1*l.*, at a standard of 50*l.* per ton for tin. I need scarcely say that this mine is opening up in depth quite equal to expectations, as our returns of tin have proved that the lodes are considerably improving in depth. We have in the 50 fm. level (which is the deepest) a lode for 45 fms. in length, varying from 2 to 6 ft. in width, worth on an average 15*l.* per fathom; and the lode in Pressure shaft, sinking below this level, is going down in a capital lode for tin, plainly showing that we have a good mine in depth. In addition to this, our deep adit level, south-east of Vivian's shaft, is now getting into the run of tin ground gone down in the bottom of the shallow adit level, south east of Pump shaft. And looking at the lode we have driven through in the deep adit level, with its gossan, copper, mundic, and tin, I don't think it can fail to make a good lode in depth; and if our 20 fm. level which we are driving does not prove to lay open some valuable ground I shall be sadly disappointed. Then comes Pink lode; we have four tribute pitches working on this lode in the bottom of the 40, at 5s. in 1*l.*, and I can see no reason why we may not open up ground for many more pitches that will work at the same tribute as our 50 is driven east and west of the caunter. I should like to be allowed to put six men more to work in the eastern part of the sett, two with those now working there and four others to clean up a shaft further east, as I should like to see these shafts cleaned up before winter sets in. Taking our mine as a whole, I think our prospects are such as to recommend an increase of stamping power, so that we may not only be able to return all our tinstuff in the winter, but in the summer also. The water during this month has been very little; with the exception of two or three days we have only been able to work eight heads of stamps. I am hoping that we shall be able to get about 8 tons of tin ready for the market against our usual time. We have employed on the mine 92 men, 20 boys, and 21 girls=133.—John Pope.

The Chairman expressed regret that so few shareholders were present, though from what he had seen of mining companies' meetings he supposed that if there had been a dividend to declare there would have been fewer. The principal object of the present meeting was to make a call, and they would see from the accounts that the total loss had been 351*l.* 16s. 10d., but as this included 100*l.* for land damage, which had been going on for several years, and, therefore, would not appear again in their accounts, at least for some years to come, their actual loss was 251*l.* 16s. 10d., or at the rate of 50*l.* per month, and it would not have been so much as that but for the dry weather having prevented them from dressing their tin. He might, upon the whole, congratulate them upon the position of the mine, and Capt. Josiah Thomas, of Dolcoath, who had inspected the mine, and whose report had already been distributed among the shareholders, stated that "the 50 is a much better level than the 40, and the lode in the shaft under the 50 has a very promising appearance for continued productiveness, the granite being of a favourable character;" when the lode enters far into the killas it becomes much less productive. The principal effort should be directed to the opening up that part of the lode which is most likely to be valuable, and to this end Pressure shaft should be sunk as rapidly as possible. Their shaft was going down and still improving, and at the 60 fm. level they were driving to the Pink lode, and it is reasonable to suppose that they would have a productive lode for 30 fms., and a considerable piece of stoping ground would be laid open; they might then think of putting up more stamping power, and thus carry out the recommendation of Capt. Josiah Thomas, who says—"Your tinstuff is good in quality, producing, as far as I can gather from your returns, about 50 lbs. of tin per ton of stuff, which is considerably above the average of the county. The quantity you can return, however, is limited by the insufficient stamping power you possess. It is true you have not a very large quantity of ground laid as reserves, but the bottom of the 50 is all standing entire, and, judging from the present appearance of the lode in the shaft, I think you would be justified in erecting a larger stamps, which, with suitable dressing-floors, might, probably, be done for about 500*l.*, unless as a matter of caution you might like to wait until the shaft is sunk a few fathoms deeper, and another level opened on the lode." The last observation he (the Chairman) quite agreed with; he thought it would be the preferable course. He was not aware that he had any further observations to make, but was quite prepared to answer any enquiry that might be made. He might add that the report from Capt. Pope was, on the whole, satisfactory, and but for the price of tin would have been extremely so. The price of tin had been a great drawback; had it been the same as a year ago they might now have been paying a dividend. He concluded by moving the reception and adoption of the report and accounts.—Capt. Gladstone seconded the resolution, which was put to the meeting, and carried unanimously.

The Chairman said that the next business before them was that of finance; to pay off their existing liabilities would require a call of 2s. 6d. per share, and he would, therefore, propose that a call of that amount be made, payable in fourteen days.—Mr. Bolton seconded the motion, which was unanimously agreed to.

Mr. C. Thomas remarked that there was an explanation with regard to the 100*l.* land damage which should be given to the shareholders. The land damage had been going on ever since they had been working the mine, and the amount was due to Mr. Hawkins and Mr. St. Aubyn. The claim originally made was for 125*l.*; but upon making application to Mr. Chilcott, of Truro, the solicitor to the lords, they got it reduced to 100*l.* The lords had behaved very liberally upon all occasions.—The Chairman said that the royalty had been reduced to one-half, after having been foregone altogether for six months. They were now paying 1-40th dues. He might take the opportunity of expressing regret for the death of Mr. Hill, who had for many years been the agent of the lords, and was always particularly considerate for the adventurers.

The usual complimentary vote terminated the proceedings.

WEST TOLGUS MINING COMPANY.

It must be encouraging in these times of general depression, so far as mining in Cornwall is concerned, that there are some adventurers who can hold their own, notwithstanding the many provoking influences brought to bear against them. And much more encouraging must it be when all those influences can be met and overcome, and a dividend out of the results of the working of the adventurers be declared, such as is the case in West Tolgus. This mine had been worked for many years under circumstances far more favourable that at present, but has never made any important returns, yet just at this moment of difficulty it has worked itself forward, and may now be looked upon as a paying concern. At the two-monthly meeting, held on Friday, and presided over by the purser, Mr. Haye, the adventurers were most pleasurably astonished to find that there was a balance of 927*l.* in favour of the mine, a result of the two months' working, which placed them at once in the position to pay the first dividend which has ever been declared in connection with it.

The accounts showed that the labour cost for May was 818*l.* 10s. 10d., and up to June 26, 803*l.* 7s. 3d., making a total of 1621*l.* 18s. 1d.; merchants' bills, 1214*l.* 8s. 7d.; and charged on account of thirteenth month, 170*l.*; making a total expenditure of 3006*l.* 6s. 8d. On the credit side there was realised by copper ore sold, 618 tons, 3934*l.* 1s. 3d., and a balance of 927*l.* 14s. 7d. was thus left in favour of the mine. At the last account the purser stated there was a balance against the adventurers of 342*l.* 7s. 1d., and this being deducted from the sum now in their hands left them with the sum of 649*l.* 17s. 6d. at their disposal. The agents' report was read, as follows:—

There has not been anything done in the bottom of Taylor's shaft. Since the last account meeting the shaftmen have been employed in fixing bearers, cistern, &c., at the 125, and repairing the shaft above the 65. The 125 west has been extended 37 fms. from shaft. The last 27 fms. have been in the course of the lode, which has yielded 10 tons of good ore per fathom. The end has been suspended, and the men are put to rise near the end, for the purpose of giving better ventilation. The lode in this rise is 6 ft. wide, yielding 11 tons of good ore per fathom; rising by eight men, at 8*l.* per fathom. There is one stope east of No. 1 rise yielding 7 tons of ore per fathom, by six men, at 3*l.* 10s. per fathom, worth 45*l.* per fathom. The 115 west is being driven by four men, at 5*l.* 10s. per fathom. The lode is 18 in. wide, containing a little ore. The lode in the 95 west is all the size of the end, with a little ore throughout it, but hardly enough to value. Those men are now put to rise against the winze sinking below the 85. We shall have to drive this end about 6 fms. more to get under the place where we first met with ore in the 85. The lode in the winze sinking below the 85 is split. The winze is being sunk on the north part, which will yield 2 tons of ore per fathom. The south part will also yield 2 tons of ore per fathom, which will be left until the winze be communicated to the 95, which will be effected in the latter part of next month. The lode in the 85 west is 5 ft. wide, yielding 4 tons of ore per fathom. There have been 28 fms. driven in this level on the lode, which have yielded 10 tons of ore per fathom for all that distance. In the rise in the back of the 85 (which is 10 fms. behind the end) the lode is 5 ft. wide, yielding 8 tons of ore per fathom. There is a stope in the back of the 85, west of No. 2 rise, yielding 3 tons of ore per fathom.—Richards' Shaft: The shaftmen have just completed the shaft work, and in the course of a few days will begin to sink below the 65. The lode in the 65 west is small—18 in. wide, with spots of ore, but not enough to value. The lode in the 55 is 18 in. wide, but unproductive. There are two stopes in the back of the 55, east of the shaft, yielding 3 tons of ore per fathom, worth 18*l.* per fm. There is one stope in the bottom of the 55, east of shaft, and east and west of the winze, yielding 4 tons of ore per fathom, worth 24*l.* per fathom. Taking the prospects of the mine generally they are not quite so good as they were at the last account meeting, in consequence of the failure in the 85, which for the last 2 fms. has only produced 4 tons of ore per fathom. We are, however, expecting an improvement in the 95, which will soon be under the long run of ore ground gone through in the level above. We also anticipate a further continuance of the course of ore in the 125, as we are not got under the ground in which we had the richest bunch of ore in the 115. The ores sold for the next two months' account, after deducting the dues, will amount to 3917*l.* 18s. 9d., and we calculate will leave about 800*l.* profit. We have also sampled to-day 225 tons of good quality ore, this being the first sampling for the September and October accounts.

In answer to questions, Capt. Haycock said the value of the 85 fathom level had gone back from 10 to 4 tons of ore per fathom. But it had not been so good at all times as it was now, and he expected a further improvement before long.

The Purser expressed the pleasure he felt in being enabled to inform the adventurers that Mr. Taylor had had an interview with Lord Robartes, and that his lordship had most kindly and considerately consented not to take any dues until the end of June, including the ores sampled that day, and that after that he would be satisfied with a moiety of 1-40th. (Hear, hear.) This must be most gratifying to them all, and he accordingly moved that the best vote of thanks be accorded to Lord Robartes for his liberality towards the adventurers.—Mr. Woolcock seconded it, and it was carried with unanimity.

The Purser then proposed that out of their available balance a dividend of 1*l.* per share be declared. This would be the first dividend in connection with the mine, and it was, he was sure, a pleasure to them all to find that they occupied their present position. (Hear, hear.) Mr. Taylor would have been happy to have proposed this, but he had had a communication from him, saying he should be unable to be present.

The motion was readily seconded and agreed to, and the meeting then terminated.—*Western Daily Mercury.*

Carn Brea.—In connection with the accounts presented at the recent meeting of Carn Brea a comparative statement has been prepared, showing that the labour cost at the last three accounts was 5900*l.*, 7700*l.*, and 5350*l.* respectively, but as the number of men employed is not stated the figures prove but little. The statement that whilst last year 147 tons of tin realised 10,898*l.*, this year it took 168 tons to realise 9556*l.* is open to the same objection, since the quality of the tin in each case being omitted one cannot judge whether the difference be due to lower price or lower quality. The credit balance carried forward was only about 600*l.* less, so that that and the amount of two dividends is all that the mine has really gone back.

Botallack.—At the quarterly meeting of adventurers, held at Penzance on Tuesday, the accounts showed a profit on the three months' working of 383*l.* 19s., reducing the debit balance to 2503*l.* 3s. 6d.

South Crofty.—At the meeting, on Wednesday (Mr. Rodd in the chair), the accounts showed a loss on the three months' working of 459*l.*, as against 873*l.* last quarter. The present debit balance is 1840*l.* The report of Capt. Josiah Thomas was decidedly encouraging. The reduction in working costs shows a saving of upwards of 600*l.* during the past quarter; but it must not be lost sight of that this reduction is in a great measure due to the cessation of working certain portions of the mine which is, of course, adverse to fresh discoveries. The resumption of the sinking of the shaft has lately been conducted with favourable prospects of improvement. Their coal is reduced in price from 25s. per ton to about 19s., with every prospect of further reduction. Every care and proper economy will be observed in the working and management of the mine.

East Gunnislake and South Bedford.—At the meeting at Liverpool, on Tuesday (Mr. E. S. Holland in the chair), the accounts showed a credit balance of 53*l.* 12s. 9d., and an estimated debit at the November meeting of 226*l.* 7s. 3d. A call of 2s. per share was made. Capt. Bray reports that seeing they have only 6 fms. further to drive in order to reach East Gunnislake sett, he would recommend the adventurers to drive the same, which will take about two months to complete. Providing they do not meet with a course of ore in driving this ground he thinks it will be prudent to suspend operations in this part of the sett, as they have other lodes which are well worth prosecuting.

CALDBECK FELLS CONSOLIDATED LEAD AND COPPER MINING COMPANY.

The half-yearly meeting of shareholders will be held at the offices of the company, on Thursday, when the directors' report and statement of accounts will be presented. The report states that—

Your directors beg to submit the statement of accounts for the half-year ending June 30, with a report on the condition and prospects of the mine from the manager, Capt. Polglase. From a perusal of the capital account it will be seen that 126*l.* of preference share capital is still unconverted, that 1364*l.* of debenture stock was in arrear on June 30, which has since been reduced to 640*l.*; and it is expected the latter will be paid very shortly. Your directors propose calling up the balance of the 10,000*l.* to be payable on September 14, and they would be glad if the holders of the unconverted preference shares would also agree to pay on the same date the balance due from them in one amount, and so give the directors the use of the capital. The only item charged to capital is for a portable engine, with pumping and winding gear, to be used at the interior shaft, where the supply of water to work the water-wheel is found to be insufficient.

As anticipated at the last general meeting, the expenditure, as shown by the accounts, exceeds the receipts considerably, the profit and loss account showing another increase in the debit balance to the extent of 206*l.* 5s. 2d. The directors would, however, draw your attention to the fact that the sales of ore are 1110*l.* 11s. 8d. less than the preceding half-year, and 1283*l.* 5s. 7d. less than the corresponding period in previous year, an explanation of which will be found in the fourth paragraph of the manager's report. The only item of expenditure calling for particular explanation is the charge for underground work, which is 329*l.* 10s. 10d. in excess of previous half-year, but is 219*l.* 3s. 3d. less than the charge for half-year ending June 30, 1873; if, however, reference be made to the manager's report it will be seen that over 60 fathoms of new sinking and driving have been done since last cost charge (the cost of which is included under the head of underground work), which your directors consider might very properly have been charged to capital; they, however, prefer not doing so without specific instructions from the shareholders, but they are of opinion that the amount standing to the debit of profit and loss account on December 31, 1873, ought to be transferred to capital, and thus let the former account show the condition of affairs since the raising of the debenture stock. In conclusion, your directors ask of you a careful consideration of Captain Polglase report, with the view of carrying out his recommendations.—Walter Gath, Secretary.

Caldbeck, Aug. 12.—I beg to hand you my report of the work done for the short time I have been in the office, together with the general prospects, for the half-yearly meeting. I first set the bargains on March 31, and had to get men from Cornwall, with the few hands here, to commence operations; since then up to June 20, we have driven levels, 44 fms. 3 ft. 4 in.; cross cuts, 7 fms. 5 ft. 9 in.; winzes sunk, 4 fms.; shaft sunk, 7 fms.; ground stoped, 50 fms., besides repairing levels, railroads, putting in stulls, securing ground, &c. The prospects of the mine are encouraging, not so much in respect to the lead ground as to the copper. The lead is a low-price article here, and the principal shoot of lead is short. The distance from the engine-shaft to the shoot of lead is too great to work it from that quarter, therefore the sinking should be carried on in the shoot of lead, and thus save time and money in opening dead ground. The copper is of a very superior quality, and the ground easy, therefore the success of the mine, in my opinion, depends to a great extent on the productiveness of the copper on the great south lode. If this ore ground continues to improve in depth—and indications are very favourable, which lead me fully to expect it—then, by opening ground in this direction better results may be expected; but to suppose, after the mine having been set on tribute, and every available ton of ore extracted, then to begin *de novo*, and make large returns immediately, is out of the question.

It would be the height of folly for me to attempt to delude the shareholders in promising great things, as this practice has brought many a good thing to grief. I am always glad to state good prospects, and such we have, but ground must be opened on the course of the lode, and every effort must be put forth in bringing the mine into a proper working order; in order to do this, we are now preparing a place underground for the portable engine to wind the stuff, now costing a very high figure, and lay down railsroads in the levels, so that we may work with economy. Pumping gear is also provided with the portable engine in case of water being short. The dry summer has been a great hindrance to us, especially in not being able to drive the 20 fm. level east under the ore ground, and also in stopping us from sinking the new shaft on the great south lode, which is down to the 10 fm. level. These are the chief points of interest in the mine, and by opening this ground rapidly is the great chance of success, and I promise you most cheerfully to do my utmost in carrying out those views, which I believe will be attended with good results. Men employed underground, 62: dressing, 26; carpenter and smiths, two men and two boys: total, 92.—A. Polglase, Manager.

EBERHARDT AND AURORA MINING COMPANY (LIMITED).

The meeting of shareholders will be held on Tuesday, when the report of the directors and the accounts will be presented. The report says—

In submitting the enclosed statement for the past year, the directors would point out that although the working for the year presents an apparent loss of 801*l.* 13s. 6d., the actual result is a profit of 498*l.* 12s. (this result was accomplished by only six months' working, five of which were with the South Aurora Company's mill); and a further profit of 700*l.* would have accrued had the company been in possession of a mill of their own. The balance, 8517*l.* 5s. 6d., represents liabilities which had been incurred by the late manager, and not charged in his accounts. The directors much regret that their urgent appeals to the shareholders did not succeed in producing funds which would have enabled them to have cleared off the Nevada liabilities, and have assisted Capt. Drake in his exertions to bring the company to an early success. Although Capt. Drake has not been furnished with the means to develope the Eberhardt Mine as he wished, he has explored upwards of 650 ft. in the North Aurora section of the company's property, and that with very satisfactory results, the latest advices being most encouraging, the average assay, 38*8* per ton, being higher than at any period during the last two years. The directors have great pleasure in being able to report that Captain Drake has erected a most substantial mill, fitted with every modern improvement for efficiency and economy in working, which will necessarily tend to reduce the cost of milling. The directors cannot conclude their report without placing on record their high appreciation of the services of Capt. Drake, and of the tact, energy, and perseverance with which he has conducted the affairs of the company in the trying and difficult position in which he has been placed, and they have every reason to believe that, with funds for the proper development of the mines, he will justify the confidence they have in him, and in the resources of the property. The directors have with regret to announce the retirement from the board of Messrs. F. W. Wyon, W. T. Allen, and J. Pearless, the latter relinquishes his seat through residence in the United States. The board have deferred filling up these vacancies, in order that the shareholders may have the opportunity of appointing members of their own selection. The following gentlemen retire by rotation:—Messrs. A. D. de Pass and Wm. Baxter, and, being eligible, offer themselves for re-election. Messrs. Samuel Slater and John Hampton Hale, the auditors of the company, also retire, but are eligible for re-election.

For remainder of Meetings see to-day's Journal.]

Mining in California—The Half-Year's Dividends.—During the half-year ending June 30 the dividends from mining companies on the San Francisco Stock Board amounted to $6,049,600, against $7,416,000 in the corresponding half-year of 1873, the diminution being equal to 20 per cent. There were 12 companies paying dividends in 1873, and only nine in 1874. Cedarberg, Eureka, K.K. Consolidated, La Grange Ditch, Meadow Valley, Monitor Belmont, and

Raymond and Ely, which were in the list in 1873, have ceased to pay dividends, whilst Consolidated Virginia, Keystone, Lyon Mill, and Redington Quicksilver, which were not in the Dividend List for the first half-year of 1873, appear in the present list.

TAN-YR-ALLT (CARDIGANSHIRE).

This mine, which was recommenced at the beginning of the year by a few gentlemen, is turning out very well, as may be seen by the reports we subjoin. It is situated in a district which has from time to time produced large quantities of silver-lead; only last week a detached stone was dug up at surface in the neighbourhood weighing from 8 to 10 cwts. The present company are going to work in a miner-like way in carrying the mine down in depth, for there can be no doubt that it is in depth that lead must be looked for in paying quantities; and it is to be regretted that so few of the Cardiganshire mines ever have been given a fair trial in depth. Even at the shallow points which have been worked shoots of ore have been met with which have realised from 10,000*l.* to 20,000*l.*, yet when these ceased the mines have been abandoned. Judging by the reports, the proprietors of Tan-yr-Allt are likely to have a prize when they have carried the mine down 20 or 30 fms. deeper; a lode which produces 2 tons of lead per fathom at 9 fms. deep can hardly fail to prove rich at deeper points; and at Esgair-hir, which is on the same run of east and west lodes as Tan-yr-Allt, lead has been met with from 3 to 5 ft. solid; and at Allt-y-Crib, which has the same north and south lode passing through it, they had some of their richest deposits from that lode. A very unfounded prejudice seems to exist in Wales against north and south lodes, but in Cornwall many of the greatest lead mines have been on such lodes—for instance, Trelawny, Trewetha, Coombmartin, and East Wheal Rose; and in Devonshire the well-known Beeralston Mines are all on north and south lodes, and we trust the further development of Tan-yr-Allt may prove how mistaken the prejudice is. The mine is nominally divided into shares of 100*l.* each, but is in reality held by a few gentlemen.

Aug. 20.—I have felt some interest in the development of this property, the Tan-yr-Allt, having been concerned in the opening up of it some two or three years ago, when from very shallow workings we sold about 30 tons of ore, taken principally from a winze sunk on a lode running south-east and north-west. This, however, is not the main lode of the mine, which is a north and sonth one, and on which the adit level has been driven, and a second winze sunk at the point of intersection of these two lodes; at the bottom of this a fine rib of silver lead ore was discovered, worth abont 1 ton to a fathom; owing, however, to the water the mine was left. The present proprietors have, however, erected a 20 feet water-wheel and all the appliances for pumping, and have commenced to sink this winze a little deeper before driving out north and south to lay open backs. And the object of my visit yesterday was to see the present bottom of this winze; owing to the preparations for sinking, the water was rather troublesome, and it was, therefore, difficult to judge: but I am pleased to say I found a great improvement, large stones of ore coming from the bottom, in which I should say the lode has improved so nearly double its previous value, and is looking most encouraging.

I am the more anxious to see this mine prosecuted, it being a north and south lode, which the miners of the district seem to be prejudiced against, although the agent of the adjoining mine informed me that out of hundreds of tons of ore sold from this mine the best courses of ore came from this lode. And in Devonshire or Cornwall such a lode would be much prized, being of a splendid character and size; and my opinion is that this, together with the many east and west lodes known to exist in the sett, makes Pany-yr-Allt one of the best speculations I know of in this locality.—JOHN WILLIAMS.

Aug. 8.—At the request at of Mr. C. Herbert Stokes, I this day visited the Tan-yr-Allt (Cardiganshire) Silver-Lead Mine, and the following is my report:—The adit level is driven as a cross-cut for a distance of 40 fathoms, where it intersects the north and south lode, on which it is then driven for a distance of 100 fms. south. In this drivage there is a very masterly lode throughout, varying from 8 to 10 feet wide, and in many places considerable quantities of ground appear to have been stoped away; the lode is composed of flookan, spar, blende, and galena lead. The end is looking particularly well, in a very productive channel of ground, and producing copper, blende, and silver-lead; good saving work: 20 fathoms from the point of intersection there is an east and west lode crossing, supposed to be one of the Penpompren lodes; this has recently been driven on for about 5 fms., it is 2 ft. wide, with a promising appearance, and producing good stones of lead; and when this junction is met with at a deeper point I think it is very probable rich deposits of lead will be found.—Adit Cross-Cut: About the same point as the above working a cross-cut was started south-west to cut another east and west lode which was found, and some lead was stoped away from it; at this point they sunk the No. 1 winze. This is 9 fathoms deep, and was productive throughout, insomuch that both ends are stoped away. There was a little water in the bottom, so that I could not see it; both the agents showed me some fine stones of lead broken from the lowest point.—9 Fathom Level: This was driven from the foot of the No. 1 winze to cut the north and south lode, and a productive lode was cut after driving about 25 fathoms. A winze was sunk from the adit to meet it; at this point the lode is much improved from anything seen above: it is 4 feet wide, composed of flookan, blende, copper, sulphur, and a solid rib of silver-lead over 4 in. thick. This is a fine stratum of ground, and is the most important point I have seen in the mine. Taking into consideration the shallow depth at present attained, I consider the mine a very good one. I have seldom seen such favourable indications so near the surface. I would recommend the further sinking of No. 2 winze, and extending the levels north and south, so as to come under the rich ground stoped away from the adit to the south, and to meet with the Penpompren lode to the north, where I should think you will find rich deposits of ore will be continuous. The machinery for dressing and pumping is ample and in good order.—ABEL PAUL.

MINERS' ASSOCIATION OF CORNWALL AND DEVON.—The Annual Excursion of this Association took place on Tuesday, when the railway companies issued return tickets to Hayle Station at single journey fare. From Hayle the party proceeded by omnibuses to Rosewall Hill Mine, where they were most kindly and hospitably received by Mr. Robinson and Captain Buglehole, who had prepared a capital *déjeûner* at the counting-house. The members of the Association present numbered about 70. After the lunch hearty thanks were given to the adventurers, purser, manager, and other agents of the mine, on the motion of the Rev. Saltren Rogers, for their hospitality, and were acknowledged by Mr. Robinson, who expressed the pleasure which it had afforded them to welcome the members of the Miners' Association to that mine. The particulars of the various lodes in the set were then given by Captain Buglehole, who described very clearly their variations in underlie, productiveness, or otherwise, in the different varieties of granite, the extent to which they have been worked, their carbonas, &c., taking the party over the mine and showing where the various operations had been and were being carried on. The dressing-floors were next visited under the same excellent guidance, and the different kinds of machinery discussed. A stock of first-class quality black tin here awaits a better price than is at present offered. The company now formed themselves into two divisions, one of which was taken on to Wicca Cove, under the guidance of the Rev. Saltren Rogers, M.A., a vice-president of the Association, to examine the interesting geological phenomena of that part of the coast. The remainder were under the conduct of Mr. B. Kitto, F.G.S., the lecturer and assistant secretary. Several of these were then taken underground by one of the agents to examine the appearances of the lodes which had been so well described by the manager. The others proceeded to St. Ives Consols, where they were welcomed by Captain Gilbert, the manager, and Captain George. The surface operations of this mine were also examined, and a lesson received in "vanning" from one of the overseers of this department, who appeared to be very skilful in this peculiar and most useful operation. The dressing was found to be under the charge of an old pupil of the Miners' Association. Returning to the counting-house, the working plans claimed attention. The deposits of tin ore known as carbonas are larger here, perhaps, than in any other mine in the county. The party having returned from Wicca, the day's proceedings were terminated with a tea which Captain Gilbert, with the most considerate hospitality, had prepared. All were greatly pleased with the manner in which they were received by the agents at this as well as the adjoining mine. Hayle was reached in time for the last up-train, those going west were taken in vehicles to Penzance and St. Just.

CORNISH PUMPING ENGINES.—The number of pumping-engines reported for July is 17. They have consumed 1946 tons of coal, and lifted 14·0 million tons of water 10 fms. high. The average duty of the whole is, therefore, 48,700,000 lbs., lifted 1 ft. high, by the consumption of 112 lbs. of coal. The following engines have exceeded the average duty:—

Creavor and Wheal Abraham—Sturt's 90 in.	Millions 63·1
Dolcoath—85 in.	58·1
West Basset—Thomas's 60 in.	55·9
West Chiverton—New 80 in.	60·5
West Wheal Seton—Harvey's 85 in.	58·4

PRECIPITATING COPPER BY MEANS OF TIN SCRAP.—Prof. STERRY HUNT, of Boston, Massachusetts, has patented an invention which consists in using tin-plate scrap or waste for the precipitation of copper from the solutions obtained in the various wet processes of copper extraction, and in saving in the operation the tin thereby tin. The copper solution must contain at the same time protochloride of copper (otherwise called cupric chloride) and sulphate of soda, or some other base. Such solutions are obtained from sulphuretted copper ores which have been calcined with common salt, as in the Longmaid or Henderson process, or when similar ores after roasting are digested with chlorides of iron or other chlorides, as, for example, in the Hunt and Douglas patent process. In case, however, the solutions of copper to be percipitated contain no chlorides, add a portion of common salt, and in case they contain no sulphates add a portion of sulphate of soda or other soluble sulphate. In either case these salts may equal the amount of copper present. Such solutions containing both chlorides and sulphates, especially if heated, as is usual in copper precipitation, very quickly dissolve the tin from tinned iron when this is immersed therein, and at once let it fall again as an insoluble hydrated oxide of tin, which may be readily drawn off while suspended in the liquid, and collected by subsidence in proper tanks, to be subsequeutly treated by methods known to chemists, such as dissolving in hydrochloric acid and precipitating by metallic zinc, by reduction in the dry way, or by conversion into stannate of soda. The scrap iron thus freed from tin is then employed in the ordinary way to precipitate the dissolved copper, as metallic or cement copper, from the solutions described. The copper solution holding the suspended oxide of tin may be drawn off at once from the iron to the settling tank, and a fresh solution added; or the precipitation of the copper may be carried on without interruption in the first solution till this is exhausted, and the oxide of tin afterwards separated from the metallic copper by taking advantage of the greater lightness and the more finely divided state of the former. Should it be desirable to remove the tin from the iron plate without causing an immediate precipitation of copper thereon, this may be effected by mixing a solution of perchloride, or other persalt of iron, with the copper solution.—Claims: 1. The use and application of tin-plate scrap or waste for precipitating metallic copper from its solutions.—2. The recovery and utilisation of the tin from the tin-plate scrap by means of its solution and subsequent precipitation as oxide of tin in solutions containing protochloride of copper and a sulphate.

SASSO FORTE COLLIERIES COMPANY.

The subjoined communication, embodying a series of important questions, has been addressed to the directors of the Sasso Forte Collieries Company by Mr. W. J. JACOB, the engineer of the mines:—

GENTLEMEN,—As a shareholder in this company, I should be glad if the board would give me a reply to the following questions:—

1.—What steps have been taken with regard to investigating the title to the Acqua Nera estate, and as to whether certain claims on the estate have been satisfactorily arranged by the vendors?

2.—If the property purchased by the company from M. M. Montelli includes not only the mineral rights but also the surface, and if not, what terms have been, or will have to be, paid for the occupation of land for buildings, roads, spoil banks, and other works?

3.—Has the land occupied by the road from I. Gessi to the mines to be paid for, or has it been gratuitously made over to the company by the proprietors, and if not, what sum will have to be paid for it?

4.—What is the exact cost of this road, and is it now or ever can it be made practicable for carts?

5.—Referring to Mr. Brunton's report, I find that he states, so far as he could estimate it, that there then was about nine millions of tons of coal. Have the directors from the explorations made still grounds for believing in the existence of such an amount of coal, and if it has been proved to extend over the whole estate? What is the area of the coal that has been fully explored.

6.—What steps have been taken towards the laying out of the colliery, and when will the necessary works be completed to ensure a minimum output of (say) 360 tons per day, as mentioned in the prospectus, or a maximum of 600 tons, as mentioned in the same?

7.—What is the amount of money already expended in Italy and in England, porportionately divided as follows:—

1.—The cost of administration.
2.—The survey for railway.
3.—All buildings (specify cost of each separate building).
4.—The road (including bridge built by Franco Lugini).
5.—The live stock, carts, &c. (giving number of horses bought and number still retained by the company).
6.—The plant and tools.
7.—The cost of pits, galleries, &c., for opening out colliery.
8.—Cost per ton of coal raised to pit's mouth.
9.—Actual cost of carriage of coal from mines to railway station.
10.—Actual cost of warehousing and sale of coal at Leghorn.

8.—What has been the total amount of coal sent away, and what is the amount realised by its sale, and in whose custody is the coal at present at Leghorn?

9.—What is the quantity of coal of second quality that has been sold at the pit's mouth to the Copper Mines Company, close by, at 17 frs. per ton, and if they are regular customers?

10.—Is the contract with the Roman Railway, mentioned in Mr. Brunton's report, the basis of which was laid when Mr. Brunton was in Italy, secured, and if so, upon what terms?

11.—What is the total amount of outstanding debts due from the company for wages, materials supplied, &c.?

12.—What is the amount of shares that have been handed over to the vendors at the present time?

13.—Have the company's men and materials been employed on the manager's private property—that is to say, in making explorations for coal at the estates of the Carpella, the plains, and upon the repairs and buildings of Vignoli—what has been the amount expended, and in what manner does the board propose that Mr. Montelli should refund such amounts?

14.—Are the provision stores for the men a private speculation of the managers, or does it belong to the company, and if so, have the half of the profits drawn by the manager been credited to the company?

15.—Is the cost of the brass band paid by the company, and if so, what amount has been paid for musical instruments, and what is the salary paid to the music master, and to what purpose has the 4 frs. per month stopped from the wages of the members of the band been applied? Are the members of the band paid for the time that they are absent from the mines?

16.—What was the amount paid by the board to Mr. Wild for his mission to Italy to arrange the affairs of the company, and what have been the results of his mission?

17.—Is the company paid for the hire of its horses when regularly used by other people?

W. J. JACOB, Mining Engineer.

FOREIGN MINES.

ST. JOHN DEL REY MINING COMPANY (Limited).—Advices received Aug. 4, 1874, per Minho, dated Morro Velho, June 29:—

GOLD PRODUCE TO DATE.—The gold extracted during the second division of June, a period of 11 days, is as follows:—

	Oitavas.		Tons.	Oits. per ton.
General mineral stamps	7244·0	from	994	= 7·287
" " Arrastres	544·2			= 0·547
Total.....	7788·2	"	994	= 7·834

Oits. Ozs. troy. Tons. Oits. Ozs. troy per ton.
7788·2 = 897·852, from 994 = 7·834 or ·8903

Morro Velho, July 1:—

MONTHLY MEASUREMENTS.—The following measurements of the excavations were taken this morning:—

	Ft.	In.
Horizontal Length of Excavation under A Shaft—		
" " " roof eastward	30	8
" " " " westward	46	8
Total	77	4
Greatest horizontal length of excavation	108	0

Advices received Aug. 7, 1874, per Gironde (s), dated Morro Velho, July 11.

GOLD PRODUCE FOR THIRD DIVISION OF JUNE.—The gold extracted during the above division—a period of 11 days—has been ascertained to be as follows:—

	Oits.		Tons.	Oits. per ton.
General mineral stamps	8033·1	from	1086	= 7·396
" " Arrastres.....	690·9			= ·637
Total	8724·0	"	1086	= 8·033

Oits. Ozs. troy. Tons. Oits. Ozs. per ton.
8724·0 = 1005·735, from 1086 = 8·033 or 926

Advices received Aug. 17, 1874, per Boyne (s), dated Morro Velho, July 17, 1874.

MINING WORKS.—In this respect the usual regularity has been continued.

In the daily output of the mine department I have again the pleasure of stating an increase has been attained. The average for the whole month of June was 150 wagons per day. During the latter half of that period the duty increased to 162, and from July 1 to July 16 the haulings a mean of 169 wagons per diem.

REDUCTION DEPARTMENT.—The machinery already in operation has been kept fully employed in reducing mineral since last advices. The ore delivered on the spalling-floor has been in excess of the requirements, so much so that a large stock has been accumulated thereon. In order to provide a corresponding increase in the stamping powers a very large force of mechanics is employed in completing the somewhat heavy repairs requisite to fit the western side of the Addison Mill for duty. This desirable object will probably be accomplished to-morrow.

GOLD PRODUCE FOR JUNE.—The gold extracted during the month of June is as follows:—

	Oits.		Tons.	Oits. per ton.
From mineral at stamps	20,973·6	from	2844	= 7·374
Ditto in re-treatment	1,785·5	"		0·627
Total	22,759·1	"	2844	= 8·001

Oits. Ozs. troy. Tons. Oits. Ozs. troy per ton.
22,759·1 = 2623·7539, from 2844 = 8·001 or ·9332

Comparing the above return with that for May, it is seen that though the number of tons treated in June is less, yet the gold obtained therefrom is in excess of that obtained in May. The working days in May exceed those of June by one, hence the greater quantity treated during the first-mentioned month, whereas to the superior gold contents is due the excess of the June produce over that for May. In both respects, therefore, the above result of June reduction process may be considered satisfactory.

COST AND PROFIT.

The gold return being.....	22,759·1 oits.	
Less loss in melting.....	125·1 "	
22,634·0, at 7s. 9d. per oit.	£8770	13 6
Cost, less amounts received in reduction of ditto	4463·	0
Profit on working for month of June.....	£4307	8 6

The cost for the month of June in milreis is slightly in excess of that incurred in May. This is accounted for by the gains on the two months' contracts for stoping and sinking, both coming in to the present account. Were these excluded, the actual outlay would have been less in June than in May. The lower rate of exchange, 2s. 1¼d., instead of 2s. 2d., however, brings the amount in sterling in the former below that of the latter. The extra produce likewise assists in favouring the balance of the month's proceedings.

It is, therefore, with much pleasure that I communicate this—the most profitable result of any month's operations since the re-opening of the mines—to the board of directors, feeling fully assured that they will consider this information as very gratifying and thoroughly satisfactory.

PRODUCE TO DATE.—The gold extracted during the first division of July—a period of 12 days—gives the following weights and standards:—

	Oits.		Tons.	Oits per tons.
From General mineral stamps.....	8410·0	from	1245	= 6·755
" " re-treatment	779·3	"		= ·626
	9189·3	"	1245	= 7·381

Oits. Ozs. tons. Tons. Oits. Ozs. troy per ton.
9189·3 or 1059·3810 from 1245 = 7·381 or ·8501

The above is not so favourable a return as that for the preceding division. It will be at once seen that the produce is due to the lower gold contents of the mineral under treatment, and this may be accounted for by the proportion of the killas in the western part of the excavations.

Nevertheless, comparing it with the average produce of the whole month of June, we find it is slightly in excess.

Telegram.—Produce for the month of July—25,760 oits., from 3480 tons; yield 7·4 oits. per ton; produce per diem, 831 oits. Profit for the month not ascertained.

IMPERIAL BRAZILIAN COLLIERIES.—From Rio Grandensi, Porto Alegre, Jund 26:—"The mining works of Sao Jeronymo are now progressing satisfactorily, and the coal recently met with in the seam to the westward is of much superior quality to that which was worked out from the old shafts. Thus is confirmed our opinion that the Arroio dos Ratos coal would improve as deeper seams were discovered, or seams lying in other directions."

RICHMOND.—Telegram: Week's run, $45,000; Richmond ore only.

EMMA.—Account of ore excavated and dispatched from the Emma Mine, &c., during the month ending June: On hand May 31, 77¼ tons. Extracted from the mine and concentrated from fillings from it, 331½ tons. Sold at Salt Lake, 365¼ tons. Average value of silver per ton, 77½ ozs. On hand June 30, 43½ tons.

CEDAR CREEK.—T. B. Ludlum, July 31: Since my last we have fired the blast in the Yankee claim, comprising 260 kegs of powder. It was a perfect success, and loosened up a large quantity of gravel. About 10 years ago a large clay slide came down from the hill-top above, and covered up the old work. We have been engaged washing this away until yesterday, at which time we commenced piping on the bank under which we had the blast. We are now washing pay-gravel, and everything connected is working well, including water, ground, sluices, shaft, branch tunnel, main tunnel, outside sluices, and under-currents. The Yankee tunnel is being driven ahead. Washing does not interfere with the prosecution of this work. The Jehoshaphat is still washing. Since my last we have fired a blast of 90 kegs of powder, which did good execution. When this gravel thus loosened is run out we may consider the claim fairly opened, so that we can wash to advantage, by being enabled to place a giants on the bottom. Heretofore we have been obliged to pipe downwards, and work to great disadvantage. The Gem is washing. All other claims have been shut down for want of water. Our ditch is nearly dry, only about 400 in. running. I am buying all the waste water I can obtain of the South Yuba Canal Company, and have partially made a contract for a constant head of 600 in. to run so long as it has any water (which will be about Nov. 1). I have kept out three reservoirs in the mountains in reserve, and have them still to draw from. I have done this for the purpose of securing water to make as long a washing season in the Yankee as possible. Our top gravel this season has turned out very poorly, and my only hope is in the bottom strata. It will be about Sept. 1 before we complete a run in the Yankee, as we cannot run constantly (owing to the rocks) until we have opened more space.

COLORADO TERRIBLE LODE.—Extracted from agent's letter of July 29, to hand August 8—"I now send you the particulars of 43rd shipment:—47 sacks first-class, weighing 7506 lbs.; 114 sacks B mineral, weighing 12,608 lbs.: total, 20,114 lbs. Assay of first class, 564 ozs. silver and 36 per cent. lead; assay of B mineral, 225 ozs. silver and 18½ per cent. lead. Concentration is doing well; my next will give you the returns for the month of July. I may say we have delivered about 80 tons this month to Stewart; the ore, I expect, will average 180 ozs. per ton; the 80 tons includes second-class from the mine. I have the 44th shipment nearly complete, and it will leave about August 5. The mine is looking well. Sale to Stewart, 9 tons 289 lbs. pure zinc; assay, 148 ozs.; price, $124·30; amount, $1136·65. Cash received. Stewart's pro. note for $3370·95 paid."

NEW PACIFIC.—J. D. Pringle, July 27: I put off writing a few days, in order to enable me to give you the result of the ore just worked at Manhattan mill; 2 tons of first-class ore assayed $1345·66 per ton; 8 tons second-class, $234·04. This ore was taken below the 400 ft. level, and 600 ft. west of shaft. This point will produce a considerable amount of second-class ore. The first-class is apparently very nearly exhausted. I am driving False level below the 400 at the rate of 3 ft. per day. The present point of working in this level is 700 ft. west of shaft. The two points above this level, and below the 400, are looking very promising. About 5 tons of ore from this ground is now assorted and ready for the mill. The level east of cross-cut is now in a distance of 65 ft.; there is very little change in its appearance since my last. Bunches of very fine ore are met with in every few feet of its driving.

NORTH AMERICA (Gold).—D. W. C. Morgan, July 29: Operations in the mine since last writing have been confined to extracting gravel from the old ground, running the main tunnel and four sub-drifts. The tunnel and one drift have been run with night and day shifts, in the former the face has been advanced 40 feet ahead of the east rise, and a second one will be put up to surface of rock this week. The rock continues to rise, and there seems small prospect of any further deep places. The sub-drifts being run are all on the south side of tunnel, and are all partly in rock and partly in the gravel; that they are not entirely in rock as in the tunnel follows from their having more grade. The extraction of gravel for the week ending July 25 amounted to 1225 loads, from which was obtained gold value estimated $1300. The whole cost of mining, including the wages of five hands engaged running tunnel and drifts, was $750. The tunnel being in rock entirely could produce no gold; the gravel from sub drifts, I am inclined to believe, paid well. A small quantity of gravel was extracted from the new ground, but it is yet too wet to mine extensively. It is intended to advance the main tunnel 160 feet further, put in a short turn out, and start off the next set of main drifts north and south. These drifts will effectually cut off the current of water now causing so much annoyance. The ground thus drained will in extent amount to nearly 5½ acres, about one-third of which will be on the sharply rising rock and the balance on the low or level rock which we have unsuccessfully attempted to extract this season. The tests already made over a large extent of the low rock give assurance that it will pay well while on the rising rock; a very large yield of gold may be looked for. The output of ground since end of last water season up to 18th inst. amounts to 39,762 loads; fully one-fifth of this came out of the sub-drifts run last winter, which were from 2 feet to 5 feet above the rock surface. This gravel could not be expected to yield much gold, being above the main gold-bearing stratum. It was estimated that 8000 loads remained over from the last season. The whole of the gravel has been washed, and the gold therefrom obtained, excepting what may yet be had from the cleaning up of a piece of bed-rock at bottom of yard, and which may amount to $1250. Bar No. 22, which is now in transit to the mint, is estimated to be worth $6700. The whole gold yield, then, has been $29,109 from the yard gravel up to the 18th inst. After the available part of the yard bottom is cleaned there will yet remain about the heads of flumes and other places, which for the present are inaccessible, gold of considerable value, probably as much as $1500, all of which belongs to this season's production. The bar obtained from the tailings returned $7408·19; this, of course, is not included in the above-mentioned amount. The only beneficial result of the two past years' work has been in the tunnel and drifts run in the new ground; these, so far as they have been run, will be paid for, as will whatever further length may be added to them before water fails.

The result of our operations from the beginning is most disappointing, and to you the future may seem without promise of anything better. Since the autumn of 1872 we have had a most unfavourable condition of bed rock to mine over for a good yield. This channel has been worked continuously westward for a distance of three miles from the point where we now are, and nowhere else has there been such a long and even slope of rock eastward in the direction from which the deposit has travelled. From the time the tunnel was started last year a rise of rock was daily looked for, and the misfortune has been that it came too late to be of practical benefit this season. I beg the directors not to despair; could they understand the situation and prospects I know they would not. Every serious obstacle, so far as can be seen, has been overcome. The question of labour, which for two years was a most vexatious one, has at last been finally settled. The Chinese element is immensely profitable for this work, and the supply is abundant. From being the sole employers of this class in this neighbourhood we now see them in nearly every mine—their general employment is our security. The ground now opened and so wet will soon dry out, and will afford a full year's work. In every particular the prospects are exceptionally good. Water to wash all the gravel we shall get out will last through August without doubt. The shareholders are naturally discouraged, and in view of so many failures in American mines held on your side, are doubtless disposed to look at this as another to be added to the already long list. Having had an experience of ten years in the gravel mines of this State, eight of which were passed in this country, I have had something to base my judgment upon. I have never from the first had a doubt as to the value of the mine. The extremely unproductive character of the particular part of the property we have been so unfortunate as to locate our operations is very remarkable and is attributable to only one thing—the unfortunate "lay" of the bed rock. The end has been reached, and there is not a particle of doubt but that the yield of gold henceforth will be ample. You may not be acquainted with the immensely productive character of these deposits when the conditions are favourable. I visited a few days since the Bali Mountain Mine, 18 miles distant from here. For two years past they have worked the high rock of their channel, and without anything like our facilities. Four acres of ground have been stripped in the same manner as we work here, and the yield from the first washing has been $350,000, and they have divided nearly half of that amount in dividends. Just at present they seem to be on a pitch of rock similar to that we have had for a long time, and for a time their gold yield may not be so good. It costs this company nearly 50 per cent. more to work the mine than it does here. The Empire Company, located two miles distant from here, are now taking out $10,000 per month from the labour of 40 men.

I am disposed to see this property come up somewhere near the original promise, and believe that the way is clear to do it in another season. If the board conclude that a new administration would be more satisfactory to them, as I have before written, I will at once stand aside; but in view of the present condition of finances I feel confident about being able to do better than a green hand.

BENSBERG.—C. Craze, Aug. 15: Victoria Shaft: The sumpmen are still driving the level west of this shaft, where the lode presents a strong and masterly appearance, and producing about 3 tons of lead ore per fathom. I have to-day broken some fine stones of lead from the bottom of the level, which looks like the top of a bunch of ore.—New Shaft: In the level west of this shaft the lode continues to yield 6 tons of lead ore per fathom. In the level east of this shaft we are stoping the side and bottom of level, where the lode produces good ore for dressing. The level in south east end of open-cast is much the same as last reported, producing a little ore. The stope in north-east side of open-cast also produces ore for dressing. No further change to notice.

MENZENBERG.—Capt. Roskilly reports that the Dickins's engine-shaft is down about 42 fms., and that the sinking to the 45 fm. level will be proceeded with as expeditiously as possible, and that the ground is good for progress.

LUSITANIAN.—Aug. 11: Palhal: The lode in Taylor's engine-shaft sinking below the 170, is 10 ft. wide, composed of quartz with stones of ore in it. In No. 96 winze below the 70, east of River's shaft, on Basto's lode, the lode is 8 in. wide, giving occasional stones of cobalt. The lode in No. 97 winze below the 38, west of slide west of Perez's shaft, on branch lode, is 6 in. wide, composed of flookan and stains of nickel. In the 170, west of Taylor's, the lode is worth fully 2 tons per fathom. The lode in the 150, east of Taylor's, is 5 ft. wide, composed of quartz and spots of ore. The lode in the 140, west of the same shaft west of slide, is 4 in. wide, composed of a dry flookan. The 120, east of River's shaft, is in a lode 2 feet wide, composed of quartz and spots of ore. The lode in the 110, east of same shaft, is 1½ ft. wide, and composed of quartz and spots of ore. The lode in the 90, east of River's shaft, is 1 ft. wide, composed of quartz, small stones of ore, and mundic; the water still coming out of the end. The lode in the 70, east of this shaft, is 1 ft. wide, composed of quartz and country. In the 28, east of the same shaft, the lode is 5 ft. wide, composed of quartz and stones of ore. The 130, north-east of Taylor's, on slide lode, is in a lode 1 ft. wide, composed of flookan and schist. In the adit cross-cut south of branch, west of Perez's shaft, the ground is very slightly improved.—Stopes on Basto's Lode: In the stope on Basto's lode above the 140, west of winze 85, the lode is worth 1 ton per fathom. The stope above the 150, west of winze 90, is worth 1½ ton per fathom. A stope below the 140, east of Taylor's, yields 2 tons per fathom. The stope above the 120, east of River's shaft, yields copper and nickel. The lode in the stope above the 90, east of winze 82, is worth 1 ton per fathom. The stope in the 70, east of River's shaft, yields ½ ton per fm., composed of cobalt and copper ore. The stope in the 160, west of 94 winze, produces 1¼ ton per fathom, composed of copper ore. The lode in the stope in the

160, west of the 93 winze, is worth 1¼ ton per fathom. The stope below the 150, west of the 93 winze, is worth 2½ tons per fathom. The stope in the 160, east of the 95 winze, is yielding ½ ton per fathom. In the stope above the 8, east of the 5 winze, the lode is worth ¼ ton per fathom. The stope above the 28, east of River's shaft, yields ¼ ton per fathom. The stope in the 18, east of winze 75, on the branch lode, yields 1 ton per fathom.—Carvalhal: The 50, east of Incline shaft, on great lode, and the top adit level south, east of River's, on Valley lode, are suspended. In the 60 fm. level cross-cut, south of Incline shaft, the ground is not so very hard for boring, but it does not open very well.

[For remainder of Foreign Mines, see to-day's Journal.]

MINING IN SOUTH AUSTRALIA.

COPPER.—The prospects of mining enterprise have materially improved since our last summary. All fears of another strike on Yorke's Peninsula have passed away, as the rise in copper, and firmness of the home market obviated all necessity for retrenchment in the working expenses of the great mining properties. The last take at the Moonta and Wallaroo Mines went off satisfactorily to the miners, and they are now at full work. One consequence has been advance of 3*l*. or 4*l*. in the value of Moonta shares, the last sales having beeen made at 16*l*. 10s. per share. The old workings are, as usual, turning out large quantities of ore, and the back of a new and promising lode has been struck. There are not quite so many hands at work in the Wallaroo Mine as previous to the strike, but otherwise it is going on as usual, profitably, it may be presumed, to the proprietors. The Devon Consols is being worked with energy, and the most sanguine anticipations are entertained that this mine will soon be dividend paying Recently, the new engine was started with much ceremony and rejoicing. The Yelta is in a hopeful condition, and turned out 160 tons good ore during the month. The lode yields 5 or 6 tons of ore per fathom. The Hamley is also looking well. One lode shows 8 tons of ore per fathom, another 3 tons, and the stopes are good.. The Paramatta is favourably reported on. During a fortnight 98 tons of ore were sampled, a third of that quantity being over 20 per cent. At the North Yelta about 100 tons of 17 per cent. ore have been dressed lately. In the Mattapara there is a lode over 2 ft. wide, showing black ore, and promising improvement. Excellent ore is being got out of the Wheal James in several places. The Poona, Nalyappa, and other mines are yielding ore, and other properties give prospects of payable copper-bearing lodes. We have scarcely any copper news away from the Peninsula this month. The Bremer is improving, and the miners are in paying ground. Ore is being got ont of Malcolm's Barossa, and as soon as the necessary machinery is fairly at work 8 or 10 tons weekly will be raised.

GOLD.—The gold in South Australia proper can soon be disposed of. The Blumberg Reef claim is being worked both for alluvial and quartz, and gold is showing in both. Gold-bearing quartz is being got up from the Kangaroo Reef. The Lady Alice, in the Humbug Scrubb, is quiet, the crushings having ceased while new ground is being opened up. Meanwhile copper is being met with, and there is, of course, a probability that the precious metal may die out, and the mine become altogether cupreous. From the Northern Territory we have had excellent news during the month. On May 23 telegrams were received, stating that the proprietors of the Union Reef had crushed 10 tons of stone, and obtained 771 ozs. 1 dwt. of gold, and that is about 3000*l*. worth. Six days later we heard that from the Alexandra claim, 30 miles from the Union, 33 tons of stone was crushed, and yielded 245 ozs. of gold, the stone not having been picked Three tons from the Morning Star returned 12 ozs. From Westcott's, 20 tons gave 50 ozs. Good news comes from other properties, experiments on a smaller scale being most encouraging. The alluvial about Sandy Creek and the Union is said to be profitable to the diggers, some making considerable gains at it. The steamer Gothenburg has left the Territoty for Adelaide, with between 4000 and 5000 ozs. of the precious metal. It is worth noticing that of all the quartz crushings reported from claims many miles apart about an ounce to the ton is the lowest yield, and that is twice the average return from all the auriferous stone crushed in Victoria. Fresh machines are being erected, and we expect to hear of a number of trial crushings in the course of a few weeks.—*South Australian Advertiser*, June 18.

JOHN BRIGHT, AND THE EMMA MINE.

The Hon. John Bright, the eminent English orator and statesman, in response to the enquiry of a correspondent, writes as follows:—

"The Emma Mine business is a dismal story, but I think you must see that I can do nothing in it. I am astonished that men should venture in such undertakings, and especially that they should be led or misled by names of public men and politicians. Follow politicians, if you like, in politics, but not in investments of money, least of all in mining. I do not suppose anything will be recovered from the rascals in the States. Whether you can get anything from their allies or dupes in this country is a question of facts and of law, about which I can give no opinion. You must excuse me from expressing any public opinion upon the melancholy story about which you have written me."

Like many other people not near so intelligent nor reflective, Mr. Bright in denouncing the "rascals in the States" takes a one-sided view in the matter. It used to be the people of Utah who were compelled to bear the odium of any fraud that was believed to have been perpetrated connected with the Emma Mine; now it extends to "the States." But Mr. Bright, it appears, is not informed relative to the doings of that London directory which persistently "beared" the company's stock by publishing the most discouraging reports, while refusing necessary information to large stockholders. Shakespear makes Shylock say:—"The villiany you teach me I will execute; and it shall go hard but I will better the instruction." So with our English cousins in this matter of the Emma. If they were taught villany in the transaction from this side of the Atlantic, they certainly have "bettered on it." We are no defenders of fraud, and we believe there was fraud in the manner in which the Emma Mine was placed on the English market; fraud to this extent—the mine was rated at too high a figure. With careful and economical management it would have paid handsome dividends on a million and a half, but not on five millions. There was the first fraud, or error, or whatever it may be called. Subsequently rogues began to fatten on it, and then every species of legal robbery was resorted to; "bulling" and "bearing" by turns, until all confidence was lost in the mine, while it continued to turn out rich ore in large quantities. As an illustration: At the very time that it was reported in London and Salt Lake that the mine was turning out comparatively nothing, the Omaha separating and refining works were buying from it quantities of ore carrying nearly 100 ozs. of silver to the ton. Where such evidences of direct dishonesty can be produced on both sides as are now familiar to the public, it is not very ingenuous, or it betrays an ignorance scarcely defensible, for honest people on either side of the Atlantic to attempt to throw all blame on the people of the other side. If we are not mistaken, the Emma will yet be proved to be a good mine, nathless all that has been said against it.—*Salt Lake Herald*.

EBERHARDT AND AURORA.—We are enabled to give the following as the result of a conversation with William Maxwell, foreman, regarding the present outlook:—A drift run north from the Peerless chamber a distance of 50 ft. resulted in the opening up a large body of high-grade ore, and the discovery has been named the Wyon chamber. The work prosecuted shows at this writing a width of 40 ft. and depth of 60 ft., with ore on sides, top, and bottom: 28 ft. more of tunnel will connect the opening with the central shaft, whence all ores hereafter extracted will be raised by means of the steam hoisting works now being placed in position. When this connection is made the Peerless, Beecher, Ladies', and Wyon chambers will be united, and uninterrupted communication secured. In this brief item it will be impossible to give more than a summary of the whole workings, which are simply that from the Ward Beecher Consolidated on the north, to the South Aurora on the south, indications point to one of the finest properties on the Pacific Coast. Many thousand tons of high-grade rock are now in sight, and the work being done is daily exposing other and larger bodies. Manager Frank Drake has concluded to abandon the South Aurora tunnel, which for a long time has been the way used for the transportation of ores, &c., and for which a royalty has been paid to the South Aurora Company, hereafter conveying all ores thorough the central shaft. Oft-repeated predictions seem certainly to be approaching nearer a surer confirmation than ever before imagined, and we have now no hesitancy in saying that much-abused Treasure Hill will soon be the great attraction of Nevada in a mineral sense. At least, we are prepared to await the course of events, as are many others now deeply interested in the future of the district.—*White Pine News*.

Mr. Roland Irving, in an article on the Age of the Copper-Bearing Rocks of Lake Superior, says—Four grand groups of rocks are found in Northern Wisconsin—Laurentian, the Huronian, the copper-bearing series, and Lower Silurian sandstones. In Ashland county, next north of and immediately overlying the Huronian, come the enormously thicks beds of the copper-bearing series, which have, including all subdivisions, an apparent thickness of as much as 4 miles, and even more than this on the extreme east. Mr. Irving concludes that the beds of the copper bearing series and those of the Huronian series were once spread out horizontally over one another, including the whole tilted sandstones of Montreal river, and that they were thrown into their present position by an ordinary regional disturbance.

Prof. B. Silliman in a paper on the Tellurium Ores of Colorado, which were found in May, 1873, at the Red Cloud Mine in Colorado, says that at Naggag there are over 40 mineral species, but "at the Red Cloud Mine we find only native tellurium, sylvanite, hessite, pyrite, chalcopyrite, and more rarely galenite and sphalerite, with native gold as an epigene species at surface. Prof. Hill, who has smelted large quantities of the ores, finds that these minerals exist in minute particles. One of the specimens sent—the darkest coloured—was found to contain 1890 ozs. of gold and 5300 ozs. of silver to the ton of 2000 lbs.; about $50,000 in value.

IMPROVEMENTS AT THE COLTNESS IRONWORKS.—The managing partner of the Coltness Iron Company (Mr. Hunter) has turned to good account the dull season that existed while the furnaces were damped down, and introduced improvements so extensive that not only is furnace-filling reduced to the minimum of labour required, and so simplified that a youth of ordinary strength, who never saw furnaces before, is qualified for the work, but the general saving of labour in the various branches is so great that the improvements can only be appreciated by a knowledge of their details. There are 12 blast furnaces at Coltness, in two rows of six furnaces each. The rows run parallel, and the space between is about 100 yards, where a line of railway passes that has connections with the Caledonian Railway, and all the collieries and mines belonging to Coltness Company. On each side of this railway, coal and other minerals were hitherto emptied out of the wagons and "binged" for use by the furnaces, and it can be imagined how much labour was required in emptying and embanking train after train of mineral with the labourer's shovel in the ordinary way, and then, again, the re-shovelling at filling the barrows for charging the furnaces. Mr. Hunter's improvements include an ingenious plan that saves the whole, or at least most, of this labour, and it is worth the attention of other coal and iron masters. A platform about 150 yards in length, at the elevation of 16 ft., and a top width of 25 ft., is erected with a double line of rails for trucks, and another double line for steam cranes. It is likewise arranged that the trucks pass the platform on a rising gradient of 1 in 80, and by a back shunt on a similar incline are put upon the platform which is level. Each truck is then taken bodily up by the cranes, which by the way are wrought by a pair of coupled engines, with 4½-in. cylinder and a 10 in. stroke, and the door opened the contents are discharged into the space between the rails, where there is storage for 7000 tons of coal and other materials for the furnaces. The empty wagon is again put upon the rails and run to the end of the platform, where an ingenious machine lowers the wagon to its original level. This machine consists of a cage with a balance. The weight of the empty wagon lowers the cage, and when the level is reached a neat contrivance runs the wagon into a siding to be taken back to the mines by the locomotives, and the cage, immediately on being freed from the weight, is brought again to its proper place by the back balance. Not the least noteworthy part in this saving of labour is the ease with which the furnace-fillers can be loaded. The elevated platform is supported with brick walls 50 feet apart, and two rows of cast-iron columns between each of the spaces, and several of the 50-feet spaces are fitted up with triangular-shaped cast-iron receptacles for ironstone and limestone, and these are so arranged that the exact quantity of the mineral required can be discharged through a shoot into the barrow. This is the more remarkable with the limestone, as that commodity is measured to a nicety. By drawing one lever and opening another, a box is filled containing the quantity required; thus the workman can load his barrow, which holds 16 cwts., and leave the box filled for the next comer by a couple of movements of the lever. The advantage of this improvement will be patent, even to the uninitiated, when it is remembered that formerly the materials had to be be weighed and filled with a shovel before going to the furnaces.

ACTION ON COAL CONTRACTS.—At the Liverpool Assizes, on Wednesday, before Mr. Baron Pollock and a special jury, an action for breach of contract was brought by Messrs. Ellis Lever and Co., of Manchester, against the Howley Park Coal Company, of Batley. The action arose out of contracts entered into in the spring of 1872, and the damages were laid at the sum of 10,000*l*. The counsel for the plaintiffs were Mr. Pope, Q.C., Mr. R. G. Williams, Q.C., and Mr. Bayliss (instructed by Messrs. Cooper and Sons); Mr. Herschell, Q.C., M.P., and Mr. Gully was counsel for the coal company. After the case had been opened by Mr. Pope, the defendant's counsel admitted the contract and their liability, and a verdict was entered for the plaintiffs, subject to a reference.

BEDFORD COLLIERY, MOLD—VALUE OF SECOND-HAND PLANT.—An important case has been heard before Lord Coleridge at the Bristol Assizes—Arnall *v.* Williams—in which the plaintiff sought to recover 252*l*. 2s. 8d., the value of some second-hand mining pumps supplied by him to the defendant. Mr. Cole, Q.C., M.P., and Mr. St. Aubyn, instructed by Mr. Holloway, appeared for the plaintiff; and Mr. Prideaux, Q.C., and Mr. Bullen, instructed by Mr. Nordon, of Liverpool, for the defendant. Mr. Prideaux asked for a nonsuit, and held that Mr. Williams had been entitled to accept the good pipes and reject the bad ones; but his lordship said he could not do this. Mr. Prideaux then argued that 143*l*. paid into Court was sufficient to satisfy the plaintiff's claim, if he showed that some of the pipes were not in good condition within the meaning of the contract. His lordship did not look upon the contract as a warranty that every inch of the pipes was to be in the best possible condition, but if the jury thought, on the whole, that the quantity was in good condition he would say that the contract was complied with as it ought to be. The defendant and other witnesses were examined. Mr. Prideaux having asked permission to show that the order had never been completed, his lordship said that if the contract had been substantially fulfilled, the mine should be ashamed to rely on that point. Mr. Prideaux then summed up the case, contending that the contract had not been substantially fulfilled. He should be very much disappointed if they did not say that a large number of the pumps were not delivered in good condition. The evidence showed clearly that the pipes were not new. Half of them were, but the rest were old, rust-eaten, had holes in them and broken flanges. Mr. St. Aubyn said the evidence had gone to prove that 17 out of the 26 pumps were in excellent condition, and the rest of them in sufficiently good condition to be worked in a mine. He lordship, in summing-up, said that nearly an official day had been consumed in the consideration of the question of the pipes. He would put the following questions for the consideration of the jury. First, were the goods sent to Mold substantially in good condition? If they answered that in favour of the defendant, and said that they were not in substantially good condition, then it became immaterial to consider the further questions. But if they were of opinion that the contract was substantially complied with, then, in order to give the defendant every advantage, he would ask them the further questions—Was it agreed between the plaintiff and the defendant that the carriage of the goods should be paid for by the defendant out of the price to be paid by him to the plaintiff? Next, was there an acceptance of a part of the goods, in point of fact; and, next, was there at any time, and if there was, was there, within a reasonable time, a rejection by the defendant of all of the goods delivered at Mold? The verdict was given for the plaintiff, but as part of the money was paid execution was stayed until November 5, with leave to move for a new trial.

TECHNICAL EDUCATION—No. II.

THE POLYTECHNIC SCHOOL OF AIX-LA-CHAPELLE.

That education, whether technical or general, can be very cheaply obtained in Germany has been so long known that in has become fashionable in certain classes to under-estimate the merits of those who have earned their academic position in that country, from the belief that good instruction and excessively high prices for it are inseparable from each other; yet nothing can be further from the fact when the theory is applied to the German schools and universities, and very conclusive evidence in the matter can be had by merely looking around and noting how many of the most prominent men connected with the advancement of pure and applied science in this country possess no otber academic rank than that which has been given them in Germany, or, at least, possessed no other until, like Tyndall, and many others who might be mentioned, they had acquired so high a reputation that even the honorary degrees of Oxford or Cambridge could add but little to it. The misconception, however, is not altogether inexcusable, for the general public has known that degrees from certain German universities have been held by Englishmen of very inferior education, and can scarcely be expected to comprehend how widely the class of degrees vary. Any degree for which any fee whatever has been paid, conferred upon a man who has not kept terms either by attendance or examination at his college or university is absolutely worthless to hold and to grant it; yet the existence of a comparatively few of such degrees has been the source of constant annoyance to many who have honourably earned their academic position in Germany. But just as an illicit degree is not recognised as a passport to the society of men of education, so a properly earned degree is acknowledged as an honour by all whose good opinion is worth enjoying.

The Polytechnic School of Aix-la-Chapelle offers instruction at a price which in this country would be considered as absurdly low; yet having the advantage of a royal foundation, it is enabled to secure the services of professors and teachers of the highest reputation in the German empire, and provide courses which will enable every student to acquire precisely the class of knowledge most likely to prove useful to him in the particular branch of industry to which he may intend to devote himself. Considered from an English point of view, there is, of course, the inconvenience of receiving the instruction in a foreign language, but this is a difficulty which those with a taste for the study of languages will speedily overcome; and as the intercourse between professor and student is much more constant in Germany than in England, the facilities for obtaining a command of the German language are considerable. The difficulty of the language being surmounted the student will have the opportunity of receiving upon payment of only from 6*l*. to 8*l*. 10s. per annum in the aggregate for fees the full course of instruction which the school supplies connected with the trade or profession for which he is destined from a well-appointed staff of twenty ordinary professors—four occasional professors, thirteen assistants, and three private tutors, with the requisite officers, such as librarian, laboratory officer, &c. There are chairs of architecture, smelting, mechanism, and kinematics, the higher mathematics, bridge building, and the higher branches of building construction, practical geometry, and geodesy, mechanical technology, water works, road, and railway construction, pure chemistry, mineralogy, mechanics, technical chemistry, &c., and the German, French, and English languages and literature are taught.

That the students may become practically acquainted with the subjects taught in the lectures, a very complete series of plans and collections has been provided, in addition to an excellent library and reading-room. There are geodetic, physical, technological, mineralogical, and palæontological collections, with the necessary accompaniment of maps and plans, and suitable laboratory arrangements; a large collection of building materials, and collections of plans and models connected with road and railway construction, machine construction; a laboratory for technalogical chemistry, collections for chemical technology, smelting, technical hygieine, anthropology, and several others. The classes are specially arranged to suit the several classes of students, and there are separate examinations for architects, civil engineers, mechanical engineers, technical chemists, smelting engineers, and engineer-surveyors, whilst the progress which is made is indelibly recorded in favour of or against the student by passing him with the classification excellent, very good, good, tolerably good, middling, and insufficient, the diploma of the school with the grade indicated being granted to those classed good, very good, and excellent. Those who lose the examination can go up again a year afterward, but can then only obtain a pass, without the higher distinctions. From an examination of the programme of the several professors' lectures it will be evident that the wants of every class of student connected with industry are well provided for. The subjects of the first three years, which must be learned by all students regardless of the particular profession which they intend subsequently to follow, cannot fail to give so complete a command of general scientific knowledge that great confidence will be felt by employers in the competency of those who shall have attended the school, although they may not have obtained the diploma, whilst those who have gone through the special courses of the fourth year and obtained a high class diploma, will have no difficulty in establishing their claim to the most prominent positions amongst the officers of large and important industrial establishments whether in Germany or elsewhere. Although only four years old, the Rhenish Westphalian Polytechnic School of Aix-la-Chapelle promises at no distant date to attain as high a reputation for providing competent industrial officials as that which the great school of Freiberg has long enjoyed with regard to officers for mines and smelting works. The school has already a large number of students, and whilst the quantity and quality of the instruction given remains as at present continued increase of strength may fairly be anticipated.

MINERALS, AND HOW TO DISTINGUISH THEM.

Although an intimate acquaintance with crystallography will enable the successful observer, after considerable practical experience, to determine with comparative certainty the character and value of the various minerals he may meet with in the ordinary way of business, there are a very large number of persons to whom the study of the subject appears to involve so much mystery as to present insuperable difficulty; and to these "Kobell's Guide" is one of the most welcome volumes that can be found, more especially when it can be had, as it can at present, in French, instead of the less generally understood German. The new edition,* just published, is adapted from the tenth German edition, and has the advantage of retaining all the information given in the original, and combining therewith many valuable additions of Prof. Pisani. Qualitative chemical analysis, he remarks, understood as it now is, has rendered the greatest services to the study of mineral chemistry, and we know with what accuracy we recognise the different ingredients in the most complicated mixtures or compounds. It is not alone simple bodies that are dealt with in these kind of researches, but also compound bodies, and often by induction chemical associations formed by the combination of several of these compound bodies. To attain this result we have sometimes to consider, besides the different chemical characters, the physical properties of the compounds which we seek to distinguish. Thus we shall have to note either the difference of colour, or the variation of the crystalline form of the salts resulting from successive crystallisations, or the differences in the products of distillation, of sublimation, &c. The result is never obtained except when we are guided by an intimate acquaintance with the same chemical associations, and if we recognise in a mixture alum and sodic chloride, for example, it is because we well know all the chemical and physical properties of the two salts.

Minerals, he continues, may be regarded as more or less complex salts, and we see at once that we can likewise recognise them from observing their different physical and chemical characters. But here a difficulty presents itself for the chemist; no doubt he can determine the different elements of which the mineral is composed, and in some rare cases he will also know how these bodies are grouped, and what mineral species they form; this, however, is not generally the case, and more often quantitative analyses will alone give him the desired information. This is because it is absolutely necessary to know thoroughly the physical characters of the mineral under examination; in a word, it is necessary to understand mineralogy, and even then qualitative analysis alone is not sufficient. The chemist, moreover, will often spend a long time in seeking the different bodies one after the other, whilst the mineralogist will know at once which are those which need to be looked for. It was necessary, then, to find a special kind of qualitative analysis applicable to mineralogy, and which should permit the chemist even least practised in investigations of this class to determine with speed and certainty the majority of the minerals; this was the object in view with the author of the work now under consideration, and Prof. Pisani has proved by the test of several years' experience in its use in his laboratory, and by several of his pupils, that the method can be turned to good account by chemists, assayers, engineers, industrials, and the numerous amateurs who take an interest in the study of minerals. All that is required is to follow exactly the directions given in the volume, and to proceed successively by elimination, consulting when necessary for minute details any mineralogical treatise at hand, until the species to which the substance under examination belongs be ascertained. Some idea of the importance of the method of examination explained in the book will be formed when it is stated that upon the average no more than 10 or 15 minutes, often less, are necessary to determine most of the minerals, whilst by the employment of ordinary qualitative analysis the most expert chemist would take one or several hours to obtain the same result.

By way of introduction the reader is taught to recognise the degrees of fusibility, the degrees of hardness, to determine the solubility and so on; and in the "Tableau Synoptique," which forms the body of the book, the arrangement is most convenient. First, there are the minerals with a metallic lustre subdivided (the native metals and mercury being first excluded) according as they are fusible from 1 to 5, or very volatile, and those which are infusible, or of a degree of fusibility above 5, and non-volatile. And, secondly, minerals without metallic lustre subdivided according as they burn before the blow-pipe, or volatilise with facility; or are fusible before the blowpipe from 1 to 5, being little or not at all volatile (this group being further subdivided according as they give, or do not give, a metallic globule on the charcoal when heated with soda, or a magnetic mass when heated alone), or are infusible or fusible only above 5. In order that an idea may be formed of the mode in which the minerals are dealt with the translation of a couple of examples may be given.

CLAUSTHALITE, *selenide of lead*, séléniure de plomb, *Selenblei*=Pb Se, before the blowpipe is in great part volatile without melting, and covers the charcoal when the blowing is commenced with a slightly metallic grey film, which changes to white and greenish yellow. With soda it gives globules of lead, but with difficulty. Upon adding sulphuric acid to the nitric solution sulphate of lead is formed. Heated in a flask with concentrated sulphuric acid until volatilisation commences a fine green colour is communicated to the liquor, and by the addition of water a fine red precipitate, or a trouble of selenium is produced. Colour, lead-grey.

CINNABAR, *sulphide of mercury*, cinabre, *Zinnober*, Hg*S, in many varieties is lead-grey, and is distinguished by its characteristic—red powder; gives metallic mercury in the tube when mixed with iron dust and enclosed in a leaf of copper. Compare with proustite and pyrargyrite.

The chemical notation used throughout the book is that of Berzelius, which is, perhaps, to be regretted, as it is now obsolete; this little eccentricity, however, does not much affect the value of the book; but if, in editing it, Prof. Pisani had substituted the more modern notation it would certainly have enhanced its value. It is, nevertheless, a valuable practical hand-book as it stands, and as nearly all the generally known minerals are included few will require more in a treatise of this class. Prof. Pisani has been careful to arrange his facts so that slight errors in observation shall lead to as little inconvenience as possible, and where a substance might possibly be referred to two classes he includes it under both. The book is altogether a very useful little work, and will doubtless be largely read.

* "Les Minéraux: Guide pratique pour leur Détermination sûre et rapide au moyens de simples recherches chimiques par voie sèche et par voie humide. A l'usage des Chimistes, Ingénieurs, Industriels, &c." Par F. DE KOBELL. Publié d'apres la dixième édition allemande par le Comte Ludovic de la Tour-du-Pin: avant propos et additions par F. PISANI, professeur de chemie et de minéralogie. Paris: J. Rothschild, rue des Saints-Pères.

SCIENTIFIC CHIT-CHAT.—If the scientific researches of the French be sometimes less profound than those of the English and Germans, it must be acknowledged that French writers are very successful in handling scientific subjects in such a popular and readable style that many obtain, unintentionally as it were, a large amount of really useful information which they would not otherwise think of acquiring; and we have certainly a further confirmation of this view in the thirteenth annual edition, just published, of Mr. Parville's Scientific Chit-Chat,* which embraces some 350 pages of as interesting reading, describing the progress made in conection with a very varied range of scientific subjects, as could be desired. Physiology, astronomy, medicine, botany, meteorology, hygiène, &c., are in turn referred to. Referring to the St. Gothard, the substitution of the McKean drill for those of Someiller, Dubois, François, and others previously in use is referred to: and it is found that in the hands of M. Ferroux, formerly chief of the mechanical department at Mont Cenis, the work done is upwards of 50 per cent. more. The Dubois-François averages 8 to 10 centimetres per minute, while the McKean averages 15 to 18 centimetres per minute progress. With the new drills no doubt is entertained that the tunnel will be completed in eight years. They are also using dynamite instead of powder with excellent results. At Mont Cenis they made a great number of bore-holes in the face 60 centimetres deep, of course removing that depth of rock at each blast. With dynamite they bore fewer holes, 1 in. 10 centimetres deep, and thus blow down the greater thickness in the same time. Whatever subject a reader may be particularly interested in he is sure to find much bearing upon it, so that the book is well entitled to extensive patronage.

* "Causeries Scientifiques, Découvertes et Inventions, Progrès de la Science et de l'Industrie." PAR HENRI DE PARVILL. Treizièmeanné, 1873. Paris: J. Rothschild, rue des Saints-Pères.

IMPROVED EARTH AUGER.—Mr. W. SANDLIN, of Minden, La., has patented an invention which consists of a spirally flanged auger of the usual construction, provided with a pivoted and exchangeable bit for producing wells of different diameters, and connected with a cylindrical sand box, having band springs applied at the outer side for retaining the box stationary in the well. Small rollers at the upper curved ends of the band springs are carried through slots of the box between two disc-shaped collars of the auger shaft, on which the collars turn, while also raising and lowering the box with the auger. The ends of the band springs are attached by ropes or chains to the auger shaft to prevent the catching on projecting parts of the well during the raising of the auger and sand box.

HOLLOWAY'S PILLS—INDIGESTION.—How much thought has been bestowed, and what ponderous volumes have been written, upon this plague of every household, which is with certainty and safety dispelled, without fear or relapse, by a course of this purifying, soothing, and tonic medicine. It acts directly on the stomach, liver, and bowels—more indirectly, though not less effectively, on the brain, nerves, vessels, and glands, and commands such order throughout the entire system that harmony dwells between each organ and its functions. Dyspepsia need no longer be the bugbear of the public, since Holloway's Pills are fully competent to subdue the most chronic and distressing cases of impaired digestion, and to restore the miserable sufferer to health, strength, and cheerfulness.

BALANCED COMPOUND STEAM-ENGINES.

The question of the best type of steam-engines for driving mills and factories is ably discussed in a memoir, well illustrated with diagrams of engines, &c., by Mr. JOHN BOURNE, C.E., whose name is well known as the author of works connected with the steam-engine and screw propeller. He remarks that Watt's beam engine of a century ago, though an admirable instrument for its time, has long ceased to satisfy modern requirements, owing to its large first cost relatively to the power it developes, its large consumption of fuel, and other causes; and he mentions that it has long been known the most effective expedient of economy in steam-engines is the use of steam expansively. Engines working expansively, however, in order that they may not have too small a pressure at the end of the stroke to be commercially profitable must have a considerable pressure at the beginning of the stroke, and in ordinary steam-engines working with much expansion an extra strain is thrown upon the working parts by the necessity of using at the beginning of the stroke steam of a high pressure operating over the whole area of the piston, while the inequality of pressure between the beginning and end of the stroke either renders the motion of the engine unsteady, or involves the necessity of a very heavy fly-wheel, which in its turn involves other evils. To meet some of these objections, Woolf's engines have long been partially adopted; but the system has not come into very general use, as it but imperfectly satisfies the existing requirements. None of these beam engines, whatever their subordinate features may be, are adapted for a high speed of rotation, without which neither great economy nor great equability of motion can be attained.

Besides the Woolf beam engine, other forms of engines for mills and factories have been tried. Among these are the side-lever engine, the horizontal compound engine, a form of engine called the Corliss engine, with a horizontal cylinder, and a complicated species of valve-gear, and several other types, which, however, have not met with any extended adoption. The Corliss and horizontal compound have also been tried for propelling vessels, but with only very moderate success. Meanwhile, a type of balanced compound engine, with vertical cylinders, has grown up, which in the important department of steam navigation has already superseded all other types, and which appears destined to exercise the same absolute sway in the domain of land engines. In steam vessels it is well known the engines and boilers are subjected to a more severe test than that to which they are exposed on land. The engines must be able to work for days or weeks together without a moment's intermission—sometimes under circumstances in which any fracture or mishap occurring to the machinery might occasion the loss of the ship. Then, in a steam vessel economy of fuel and of space are of more importance than they are in a factory ashore, and efficiency of the motive-power must be combined with the great possible exemption from accidents, and from the necessity of frequent repairs. It may hence be set down as an axiom that any engine which is adequate for the sea will also be adequate for the land; and there is no reason to doubt that the type of balanced compound engine which has been found to be the best for propelling vessels will be found to be the best for driving factories also, to which purpose it is now being applied. As, besides being the best engine, it is also the cheapest, there can be no doubt that it must be generally adopted.

The author fully discusses the principles which should govern the judgment with regard to the best type of mill engine, and gives an example, with well-executed plates, of an engine in which these principles are embodied. It is a balanced compound engine, of 100 indicated horse-power. The bottom frame supports the shaft, in which two solid cranks are formed at right angles with one another, and on the sides of the cranks, opposite to the crank-pins, counter-weights are fixed to balance the momentum of the pistons and their connections. The bearings in the bottom frame for the reception of the shaft are bored out by a portable bar applied *in situ*. The bearings are formed of gun-metal, lined with soft metal, and this is the general character of all the bearings about the engine. The condenser is of the ordinary jet kind, and within it is placed the air-pump—the barrel, valve-seats, and bucket of which are formed of brass. The two cylinders are cast in a piece, and are fitted with liners or bushes, which form the cylinders proper, the intervening space between each cylinder and bush constituting the jacket. Between and around the cylinders is the space which constitutes the receiver. Steam is introduced at the top and bottom of the cylinders, as well as around their peripheries, to keep the metal hot, and the condensed water from the jackets is led away by a suitable cock. Each cylinder is supported by two square pillars, bent at the bottom to permit the rotation of the cranks, and formed with guide-plates near the top to guide the ends of the piston-rods. The air-pump bucket and feed-pump are worked by means of levers coupled to the end of one of the piston-rods. The slide-valves are at the two ends of the engine, and each is worked by a simple eccentric, fixed on the shaft beneath. On the back of the high-pressure valve is an expansion valve—also worked by an eccentric—consisting of two plates, which may be drawn closer together or separated wider apart by means of a right and left handed screw, turned by a small wheel on the top of the valve casing.

The arrangements for regulating the engine are very complete. By turning a wheel the amount of expansion may be varied at discretion. Both cylinders are furnished with starting valves, by means of which the engines may be blown through and started with great facility. The engines are stopped by shutting off the steam by means of a double-beat stop valve, and the blow-through valves are at such times left open; there is also a governor and throttle-valve, not shown in the plate. The motion is imparted to the machinery which has to be driven by a belt-pulley, which also serves the purposes of a fly-wheel. In cases where it is judged useful to regulate the expansion valve by the governor a species of valve-gear is employed, which is represented in a smaller drawing. Instead of the two expansion plates a small cylindrical valve is introduced at the back of the main slide, having skewed ports for the admission of the steam, and the degree of expansion is altered by turning the cylindrical valve slightly round upon its axis, which is done by a lever, deriving its motion from the governor. The cylindrical valve, like the expansion plates, is worked by an eccentric. When this engine is employed for pumping, the pumps are placed upon the second motion, and are worked at such a moderate speed that they act without shock or tremor. The engines are thus enabled to work at a high speed, and to generate much power relatively with their size, without giving too high a velocity to the water, which would involve waste of power.

CHINESE POLYTECHNIC INSTITUTION.

An energetic effort, which promises to be entirely successful, is at present being made, with the earnest co-operation of H.B.M. Consul, Mr. Walter Medhurst, to establish at Shanghai an institution intended to introduce to the Chinese a knowledge of the arts and productions of western nations. The present is a new epoch in the history of China, which, like Japan, has begun to move in the direction of scientific progress, and is manifesting a desire to avail itself of the skill and resources of other countries. As, however, the population of China is ten times greater than that of Japan, and is reputed to be equal to the whole of the rest of the human race, the new opportunities afforded by the opening to industrial enterprise of so vast and promising a field will be correspondingly numerous and important. The institution will to some extent be comparable to the International Exhibitions of Europe, since it will afford manufacturers of every class an opportunity of exhibiting such of their wares as they may wish to introduce to the Chinese market; and many articles now unknown there require only to be brought to the knowledge of the Chinese people to command a wide and increasing currency.

It is very truly pointed out that when the wants of the enormous population, as well as the immense but hitherto almost latent resources of that country, are taken into consideration, it is easy to see the great advantages that an institution of this kind is calculated to confer both upon the natives generally and upon European manufacturers and merchants. Shanghai, being the great centre of foreign commerce with the Chinese, is manifestly the most suitable locality for its establishment. To facilitate the development of the project specimens, models or engravings of machinery and tools, manufactured articles of every description, scientific apparatus, works of art, illustrated books or photographs, &c.—in fact, anything likely to benefit and instruct the various classes of Chinese may be forwarded and presented to the institution, where it will be publicly displayed, and used to the best advantage. Any accompanying explanations, together with the name and address of the contributor, will be translated into Chinese, and find a place in the descriptive catalogue, copies of which will be distributed as widely as possible. All the translations into Chinese of European scientific and other useful books that can be procured, as well as all native works of general interest, will be placed in the reading rooms. Courses of lectures on scientific subjects will be given in Chinese as occasion offers, and for this purpose presents of suitable apparatus, working models, &c., will be particularly acceptable.

That those disposed to lend their assistance may do so with the least possible inconvenience to themselves, an arrangement has been made with Messrs. John Bourne and Co., the well-known engineers and machine manufacturers, of Mark-lane, whereby anyone disposed to subscribe to the fund for defraying the expenses, or who may wish to forward for exhibition specimens of his productions, &c., may hand the same to them, and they will forward them without charge. As the chairmanship has been accepted by the British Consul, and Messrs. F. B. Forbes, the President of the North China branch of the Royal Asiatic Society; Hsu-Hsuch-Tsun, the assistant manager at the Chinese Arsenal; Wong-Yung-Ho, yamen of the Tastai, are members of the committee, the institution will not be wanting in influence, so that it may reasonably be hoped that if it be properly supported the favourable anticipations of its promoters will be easily attained.

"ADULTERATION OF FOOD, &c., ACT, 1872."

SOCIETY OF BRITISH ANALYSTS.

Mr. Wentworth Lascelles Scott, F.C.S., F.R.S.S.A., F.A S., L.M.S.A. late analyst to the Hon. East India Company, and Professor of Toxicology, and County and Public Analyst of Wolverhampton, &c., has issued an address to his colleagues and fellow-labourers in the chemical detection of adulterations of food, inviting their co-operation for the establishment of a Society of British Analysts.

The subject, though not directly appertaining to the science of mining, is of much importance to all food-consumers; and Mr. Scott, as may be expected from his high qualifications, treats the matter so admirably that we are induced to give a copy of his circular, in the hope that all gentlemen of his own profession, and many of other scientific pursuits, will appreciate Mr. Scott's industrious efforts, and unite with the talented author in furthering his views.

"The time is now rapidly approaching when the position and functions of public analysts must be placed upon a more definite and satisfactory basis than at present obtains, if the connection existing between such scientific officers and the vendors and consumers of articles of food, drink, and drugs is to be of lasting benefit to the inhabitants of the British Isles. In my opinion it is exceedingly desirable that a society or association of analysts should be formed before the close of the present year, having the following amongst its more prominent objects:—

1.—The combined action of fellows or members of the society upon all questions affecting the profession of public importance or scientific interest.

2.—The inauguration of a definite qualification for public analysts, which shall be satisfactory to the public and recognised by Government.

3.—The due amendment and consolidation of the several enactments for the suppression of adulteration.

4.—The appointment of specially qualified referees for the better and more equitable adjustment of disputed cases.

5.—The frequent meeting of the members of the society for the purpose of reading and discussing papers on appropriate subjects, and of increasing their private and professional good feeling towards each other.

I feel convinced that you will agree with me in believing that no chemist worthy of his cloth would submit to "examination" by any authority at present in existence at Somerset House or South Kensington, and that it is essential that all diplomas or certificates of qualification shall emanate from the Council of the "Society of British Analysts," or, in other words, from those of our own body who have—what neither of the above departments do possess—the requisite knowledge and experience.

At this stage I do not seek to commit you to details, but if you can accord your general approval to my proposal, kindly fill in the form annexed to the circular, and return the same to me at your earliest convenience.

WENTWORTH LASCELLES SCOTT,
Public Analyst to the Counties of Derby and Stafford, the Borough of Hanley, &c.
County Analyst's Laboratories, Wolverhampton."

OUR COMMERCIAL WEALTH.

The annual parliamentary document has just been issued which takes stock of the country during the year that is past compared with the 14 years immediately preceding. It is a statistical abstract for the United Kingdom in each of the last 15 years from 1859 to 1873, and perhaps a few figures culled from its pages may not be uninteresting. Beginning with the public revenue and expenditure, we find that in 1859 Government collected 2*l.* 6s. 3d. per head of the population in the United Kingdom, while in 1874 the amount per head was 2*l.* 8s. 2d., or about 2s. additional. The fluctuations within that period have been considerable; thus, in 1860 the amount was 2*l.* 9s. 10d. per head, and in 1871 it was only 2*l.* 4s. 5d. The total amount of local taxation in the year 1871-2 was 26,444,136*l.*, or 16s. 9d. per head of the entire population; but the expenditure for local purposes was 38,745,829*l.*—the difference between the amount collected from taxes, direct and indirect, and the expenditure being made up by loans, Government contributions, &c. The taxes, Imperial and local, amount altogether to about 104,000,000*l.* per annum, or 3*l.* 4s. 7d. for every man, woman, and child in the three kingdoms. The gross amount collected by the Government in 1859 from the Excise duties was 17,901,545*l.*, and in 1874 it was 27,115,969*l.* The increase has been derived almost wholly from the spirit and malt dues. In 1862, when the present duties on spirits were fixed, the spirit duties yielded 9,618,291*l.*; in 1874 they yielded 14,639,562*l.* In 1859 there were 397 articles and sub-divisions of articles in the tariff of import duties; there are now only 59; but, great as this reduction is, it is nothing to the sweep of the tariff between 1840 and 1859. In the former year no less than 1046 articles of importation were taxed. The taxes repealed or reduced in the last 15 years amount altogether to 37,183,251*l.*, and new taxes have been imposed at the rate of about 1,000,000*l.* per annum, leaving a net reduction of nearly 22,000,000*l.*

There has not only been a great reduction in the number of articles previously taxed, the conversion of stock into terminable annuities, and thrift and economy, have considerably reduced the National Debt. In 1859 it amounted to 830,000,000*l.*; in 1874 to 779,000,000*l.*, or a reduction in 15 years of fully 50,000,000*l.* In 1859 the estimated capital of Terminable Annuities and the amount of the Funded Debt were respectively 21,999,073*l.* and 18,277,400*l.*; in 1874 the amounts were 51,289,640*l.* Terminable Annuities, and 4,479,000*l.* of Unfunded Debt. The total annual value of the property and profits assessed for the income tax at the beginning and end of 15 years gives a good idea of the increase of wealth in the country in a comparatively short period. The annual value assessed in the three kingdoms in 1858 and 1872 was as follows:—

	1858.	1872.
England	£274,724,847	£413,223,000
Scotland	29,558,899	42,541,920
Ireland	22,855,106	26,572,707
Totals	£327,138,852	£482,338,317

The greatest increase has taken place on Schedule D, but this is partly accounted for from the assessment of quarries, mines, fisheries, canals, railways, gas-works, &c., having been transferred from Schedule A to Schedule D in 1866.

Coming to our immense import and export, we find that they have doubled between 1859 and 1873. In the former year our imports were 179,182,355*l.*, or 6*l.* 5s. 5d. per head of the population; and our exports 155,692,975*l.*, or 5*l.* 8s. 9d. per head—the totals being 334,875,330*l.*, or imports and exports to the value of 11*l.* 14s. 2d. for every human creature in Great Britain and Ireland. In 1873 the imports were 371,287,372*l.*, or 11*l.* 11s. 2d. per head; the exports were 310,994,765*l.*, or 9*l.* 13s. 7d. per head: total, 682,282,137*l.*, equal to 21*l.* 4s. 9d. per head. The shipping trade of the country has also doubled since 1859. The total tonnage of British and foreign vessels which entered and cleared the ports of the United Kingdom in that year was 22,904,259 tons; in 1873 it amounted to 44,439,986 tons. In 1859 the steam vessels, British and foreign, entering and clearing our ports amounted to 4,713,673 tons; in 1873 the tonnage was 22,762,290 tons.

In 1859 there were 10,002 miles of railway opened, the paid-up capital of which was 334,362,928*l.*; the number of passengers carried was 150,000,000, the total traffic receipts were 25,743,502*l.*, and the working expenses about 12,000,000*l.* or 13,000,000*l.* In 1873 no less than 16,082 miles were opened, the paid-up capital had increased to 588,320,308*l.*, the number of passengers conveyed were 455,634,767, the traffic receipts were 55,675,421*l.*, and the working expenses were 30,752,848*l.* Other figures, all tending to show the enormous progress that the country has made during the last 15 years, might be given from this statistical abtract, but it is superfluous. They all teach one fact, and that is that the country has had a period of extraordinary material prosperity. Notwithstanding the American Civil War, and the collapse for a time of the cotton manufactures, we scarcely trace that great calamity in these returns. It is questionable if we could stand prosperity like this for other 15 years. The pig cannot always continue to fatten, a nation cannot go on always doubling its sales, its purchases, and its wealth.

FOREIGN MINING AND METALLURGY.

The Belgian iron trade continues quiet, and there is little news to communicate with respect to it. A recent Luxembourg adjudication for ten lots of Vignoles iron rails, with fish plates, established prices as follows:—Couillet, 8*l.* 19s. 5d. per ton; Acoz, 8*l.* 19s. 7d. per ton; and Sclessin, 9*l.* 0s. 10d. per ton; giving an average of 9*l.* 0s. 6d. per ton, which may be accepted as the current basis price. A contract for an iron bridge over the Sambre at Franière has been secured by the Belgian Metallurgical and Colliery Company at 5116*l.* MM. Valentin and Bataille and MM. Durieux and Co. combined were only distanced in the competition by a trifling matter of 2*l.* The highest tender for the bridge amounted to 5856*l.*; the amount of the official estimate was 6472*l.* While waiting for a revival in business the Belgian works are making preparations for the industrial struggle which the future has, no doubt, in store for them. A royal decree authorises the Providence Company to establish two blast-furnaces and a rolling-mill in the commune of Marchienne-au-Pont; the new arrangements comprise 80 coke furnaces, 36 puddling-furnaces, two rolling trains worked by an engine of 100-horse power, as well as other necessary accessories. This would seem to show that confidence in the future of the iron trade has not been shaken in Belgium, notwithstanding difficulties which have to be contended with for the moment.

There has been little or no change to report in the Paris copper market. Chilian in bars has made 82*l.* per ton. There has been comparatively little business passing in copper at Havre. At Marseilles copper has exhibited some little weakness. It is difficult to describe the aspect of the German copper markets, but, upon the whole, transactions have presented no great importance. A slight fall has taken place in Banca tin at Paris; the last quotation was 103*l.* 4s. per ton. At Marseilles Straits tin has been weak, at 100*l.* per ton; while tin from English and French sources is worth 106*l.* per ton. At Rotterdam the tin market has exhibited a good deal of animation. Disposable Banca has been dealt in at 56¼ fls. to 58¼ fls.; for delivery in September sales have been effected at 55½ fls. to 57½ fls. Billiton has brought 55½ fls. The German tin markets have been very quiet; only a few sales have been effected, to meet the requirements of local consumption. Lead has shown some little firmness at Paris; French lead, delivered at Paris, has made 21*l.* 8s. per ton. In consequence of the scantiness of arrivals, business in lead has been quiet at Marseilles, but prices have, nevertheless, been well maintained. A similar report as to the firm maintenance of prices may be made with respect to the German lead markets. At Paris quotations have not varied; Silesian, delivered at Havre, has remained firmly supported at 22*l.* 16s. per ton. The Marseilles zinc market has also remained without change. In Germany the article has continued firm.

The house of Valentin and Batulle, of Brussels, which has created there an important establishment for metallic constructions, has just formed a company, in participation with the successors of the house of Castor, MM. Hersent and Zschokke. MM. Hersent and Zschokke, formerly directors and associates of the house of Castor, continue the contracts of the latter, and especially the great work of the deviation of the Danube at Vienna. The reputation which the house of Castor and its successors have acquired by great hydraulic works which they have executed places the new combination in a position to participate successfully in great bridge works and quay works which have been projected at Antwerp. Belgian industrials are making great efforts in order that the work in question may remain in Belgium. It is complained that a large new bridge which is being constructed over the Danube at Pesth, passing by Ile Marguerite, is being carried out upon a different plan and system to that proposed when tenders were invited for the works; Belgian firms were thus put to fruitless expense.

The state of the French iron trade is said to be encouraging; industrials are generally satisfied with the present, and confident as to the future. The rolling mills have almost everywhere employment, and both grey and white pig are selling well. Prices have scarcely varied since they wese last indicated. Quotations for coal in France are just now, to a great extent, nominal; they only indicate the present state of affairs, and do not afford any clue as to the future. Business has not ruled quiet, and transactions have been rather notably restricted in consequence. The fall which has occurred in Westphalia and upon the London market, as well as the last confidential communications which have come to hand from Belgium, have made sellers hesitate, although they recently appeared disposed to attempt an advance; on the other hand, buyers exhibit little inclination to purchase. The result of this state of affairs is great quietness in business, and quotations are, to some extent, nominal and uncertain.

The decision adopted by most of the Belgian colliery proprietors to maintain quotations without change during August and September months is already bearing its fruits, and the conclusion is noted of some rather important contracts for periods of several months. In the Liége basin, where stocks are extremely small, an advance of 10d. to 1s. 8d. per ton has been attempted to be established by some coalowners. There is little of a serious character about this movement, as the intelligence which comes to hand from the Ruhr announces a fall since Aug. 1 in domestic qualities of coal as well as in coal for blast furnaces. In the Hainaut some descriptions of coal have advanced, while others have fallen. There are complaints in many places of a want of labour having reduced the production of collieries; the want of labour and the absence of stocks have helped to maintain prices with firmness. M. Vanscherpenzeel-Thim, mining engineer-in-chief, of Liége, has addressed to the department of public works an interesting report on the mineral industry of the province during 1873. The production of coal effected in the province was 3,653,094 tons in 1872, and 3,674,578 tons in 1873. The value of the coal raised in 1872 was 1,830,000*l.* in round figures; the corresponding value for 1873 was close upon 3,000,000*l.* France and Holland were, as usual, the principal foreign purchasers of Liége coal last year. Prussia, including both Alsace and Lorraine, took 117,372 tons of coke from the province of Liége in 1873. In 1860 the coal production of the Liége basin was only 1,900,000 tons, of the value of 750,000*l.*

DIAMONDS.—Diamonds in the State of Georgia is a new direction of thought and speculation. Dr. Stephenson, a thoroughly earnest and well informed mineralogist, has published a little volume on the geology and mineralogy of Georgia, in which he gives his theory, and his reason for it, in this matter. He holds that the great belt of plutonic and metamorphic formation, extending in a diagonal line through Georgia, is full of outcroppings (five being designated) of itacolumite or elastic sandstone, the matrix of the diamond. In each of these ledges, Dr. Stephenson informs us, diamonds of greater or less value have been found. In Hall county, in the northern part of the State, is a belt about 30 miles wide, running diagonally north-east and south-west about 70 miles. Several gold washings are in that belt, and at every one of them, our author says, diamonds have been found, varying in size from 2 to 6 carats. Many larger ones have been found, and some very large ones were found and lost through ignorance of their being diamonds, the fact being probable from descriptions. Dr. Stephenson, now a very old man, proves his sincerity by entering upon the search for the precious stones himself, with his available though small resources.

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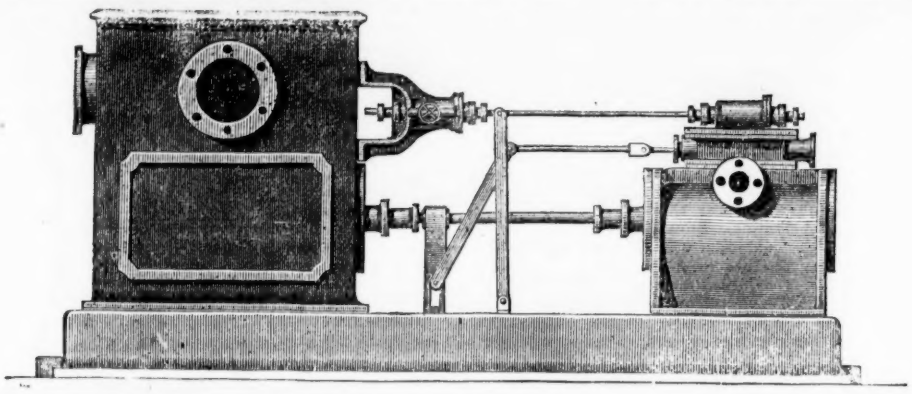

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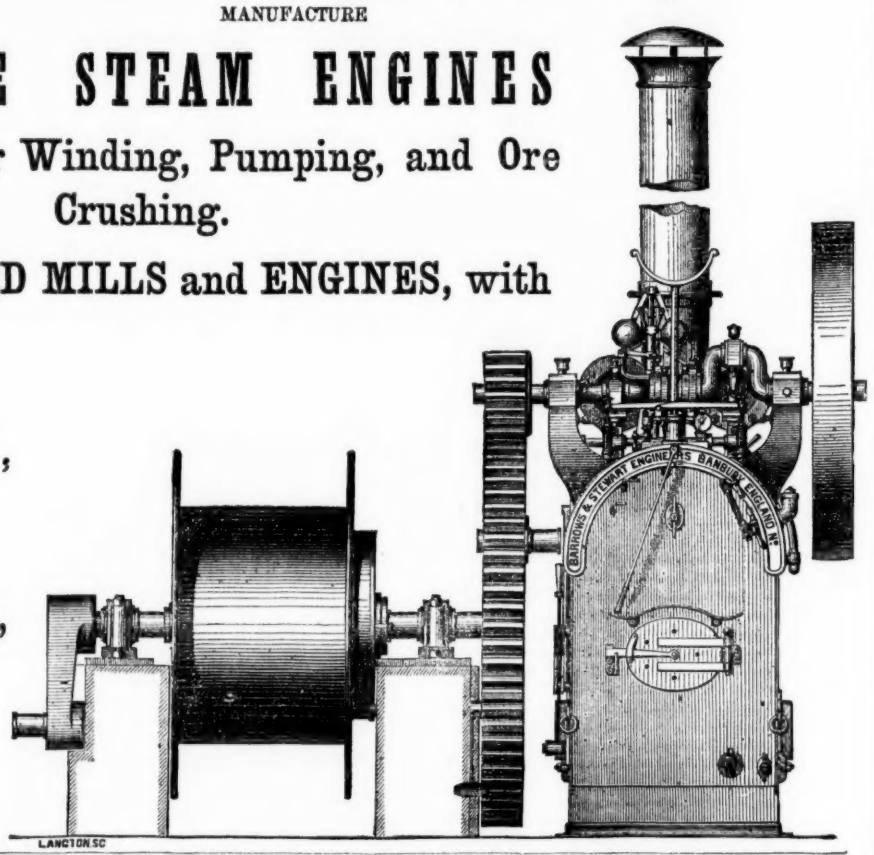

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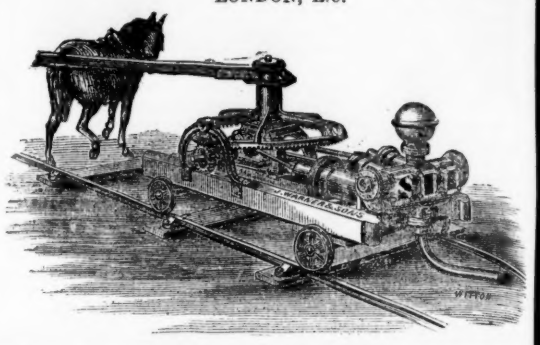

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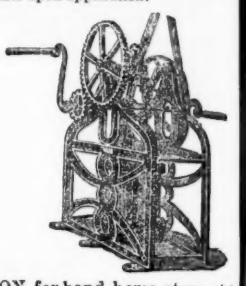

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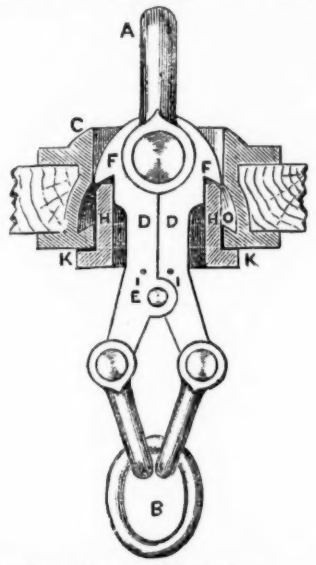

The *Newcastle Chronicle*, July 26th, 1874:—

"Although Walker's Detaching Hook has only been recently invented, it has already been adopted at the Cambois Colliery, in Northumberland, by Mr. G. B. Foster; at the Kilton, Stanghow, Slopewath, and Liverton Mines, in Cleveland; and it is about to be introduced by Messrs. Bell Brothers, J. W. Pease and Partners, Bolckow, Vaughan, and Co., and Swan, Coats, and Co. The value and importance of this invention are undoubtedly such as ought to secure its universal adoption."

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DEAR SIR,—Allow me to congratulate you on the very efficient way in which your Detaching Hook performs the duties it is intended for. I have had the one you sent me for J. W. Pease and Co., at Tockett's Mine, attached to the sinking pit rope, and not only attached, but on Tuesday, the 28th inst., I had the engine run full speed up in order to test it, and am glad to say I never saw anything act more satisfactorily. Everyone that saw it done stood amazed when the rope went over the pulley, and left the kibble, chain, &c., hanging in the ring perfect. After such a trial as this, to my mind not a doubt can remain of its perfect efficiency. I intend to use them immediately at every other place I have.

Yours truly, W. COCKBURN.

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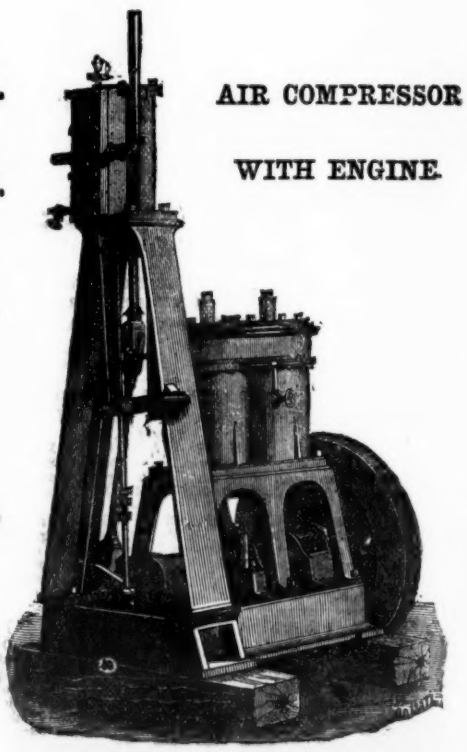

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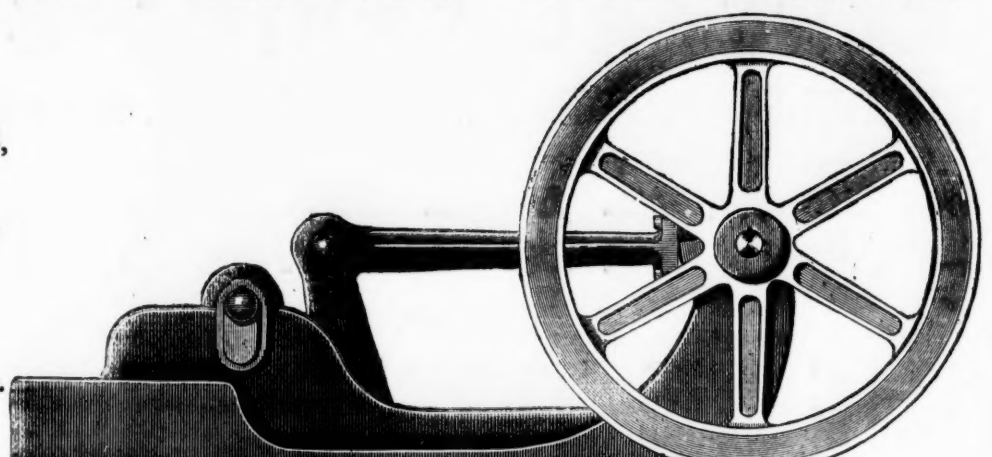

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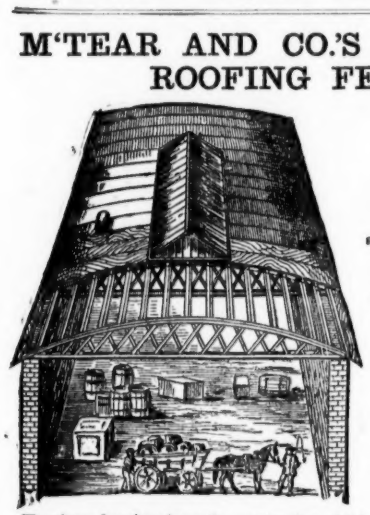

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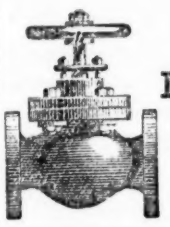

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